THE IRON TRADE REVIEW

VOLUME XXXIX CLEVELAND, MAY 10, 1906 NUMBER 19

MOLDERS' STRIKE

ADDS A NEW FEATURE TO FOUNDRY IRON MARKET.

Lake Strike On The Verge of Collapse.—Rail Orders Pending. —Heavy Demand For Nails From San Francisco.

Strikes continue to be the most important factor in the iron trade. Following the settlement of the strike of anthracite miners and the weakening of the position of the idle longshoremen, the action of the molders in many cities in quitting work looms into prominence. The anthracite strike has not been important in its relation to the iron trade, about the only effect being the banking of a few furnaces and the strengthening of coke prices. The strike of the longshoremen seems to be very near the collapsing point. They have made a most humiliating failure in attempting to get the mates to leave their boats, and it is evident that the president of the longshoremen's union was deceived as to the strength of the mates' union, which, in fact, consists of only a few men, the majority of whom are on the land a considerable part of the season on account of inability to get positions on boats. As about one-third of the capacity of the docks at which ore is delivered is in operation, vessel interests have not deemed it necessary to attempt to put non-union men at work on the docks which are idle, believing that the strikers would soon tire of their fight and be glad to return to work. The strike of foundry employes extends over a large part of the country, and may have important effect on the market, as the disposition of a large majority of the employers seems to be to close their plants until they can resume under strictly open shop conditions. The questions of hours and wages are involved, but the National Founders' Association considers that the main question is whether the union shall be recognized to the extent of making contracts with it.

Many Buyers Hesitating. The molders' strike has caused considerable hesitancy on the part of buyers in cities where the labor troubles have resulted in the general suspension of foundry work. The pig iron market is soft at Chicago although large purchases of malleable and charcoal have been made and heavy inquiries from malleable interests are pending. Malleable Bessemer has declined to $18.20, Chicago, to meet eastern competition. Bessemer and basic are strong in all the prominent centers. Both buyers and sellers of southern iron seem to be well satisfied with present prices, and there has been no change in quotations. Important cast iron pipe interests are watching the southern market carefully. Quotations of northern iron are somewhat lower in Ohio, $16 for No. 2 being freely done in the southern part of the state, and $16.25 in the Mahoning valley.

New Industrial Plants. A number of important contracts for new industrial plants have been awarded, including the steel for four new blast furnaces for the Steel Corporation at Gary, Ind., and 5,000 tons for the open-hearth plant of the Bethlehem Steel Co. Bids for the construction of the Manhattan bridge have been opened and three of the estimates are nearly $1,000,000 less than those of last year. The American Bridge Co. during April secured orders representing 61,000 tons of steel. Other companies have also done a very large business. No orders for structural material for San Francisco have yet been received.

Steel Car Orders Pending. Important inquiries for steel cars, including 20,000 from the Pennsylvania railroad, with numerous small orders, including 700 steel hopper cars for the western Maryland already placed, indicate a strong market for plates and other material needed for the construction. There is a brisk demand for bar iron from car manufacturers and prices have been reaffirmed.

Heavy Rail Business. It is announced that the steel rail requirements of the Pennsylvania system for 1907 will be 180,930 tons, and that the distribution among the steel manufacturers will be made this week. Other heavy rail business is pending.

Boiler Tube Competition. Lower prices on boiler tubes have brought out considerable business and the downward tendency has been checked. The demand from locomotive interests is heavy. About 8,000 tons of merchant pipe have been shipped to San Francisco since the first of the month.

Nails for San Francisco. The demand for wire products is exceedingly heavy, especially for nails for use in putting up temporary structures in San Francisco, for which purpose 50,000 kegs have been shipped by the American Steel & Wire Co. The business of that company during April exceeded that of any month in its history.

Sheet Makers Are Busy. Sheet manufacturers have very heavy tonnages on their books, and from many mills delivery for galvanized cannot be given in less than 12 weeks, and less than eight weeks for black. The demand for roofing for San Francisco buildings will be heavy.

Coke Prices Are Easier. Since the settlement of the anthracite strike coke prices have not been so firm, and the demand is active. Old material shows signs of improvement in some places, but, as a rule, prices are still low and unsatisfactory to the sellers.

LATE RAIL SALES.

(Special Telegram.)

New York, May 9.—Late rail sales include the following: Boston & Maine, 6,000 tons increase; Michigan Central, 1,800 tons increase; New York Central, 6,500 tons increase; City & County Contract Co., 4,500 tons; St. Paul, 100,000 tons. A large tonnage is pending.

THE WEEK IN IRON CENTERS.

PITTSBURG.

Longshoremen's Strike Causes Anxiety.—Bessemer and Basic Strong.

OFFICE OF *The Iron Trade Review*,
521 PARK BUILDING, May 9.

While the general impression prevailing in this district is that the strike of longshoremen at lake ports will not be of long duration, it has been the source of considerable speculation and no small amount of uneasiness on account of the shortage of high grade ores at several of the valley furnaces. At least one of these furnaces is entirely out of Bessemer ore and has been running on basic to prevent banking and blowing out altogether. This condition was anticipated by other furnaces before it was known there was to be a strike on the lower lake ore docks and efforts were made to buy ore to tide them over until the new supply could arrive. A month more of present conditions at Lake Erie receiving docks would place some of the furnaces in desperate straits.

Both Bessemer and basic pig iron are strong and several sales have been made and other inquiries, which will result in business within the next week, are out and they represent good tonnages. Foundry iron, while it has not shown any particular weakness, has not been active, although from the number of inquiries which have been received, indications point to a resumption of buying within a short time. There is nothing of a pessemistic nature in the finished lines and specifications against old contracts are heavy and new business has been coming in freely. The Pennsylvania lines are reported from Philadelphia as having closed for 20,000 steel cars for 1907 delivery, and the Western Maryland has closed for 700 steel hopper cars. Pittsburg concerns have closed during the week for several new structures including the erection of the steel work for four new blast furnaces for the steel corporation at Gary, Ind., by the Riter-Conley Co., 5,000 tons for new open-hearth furnaces building for the Bethlehem Steel Co. at South Bethlehem, Pa., by the McClintic-Marshall Construction Co., which will also erect a 600-ton building for the S. Jarvis Adams Co., at Midland, Pa., adjoining the new plant of the Midland Steel Co. John Eichleay Jr. Co. will erect a building for the Oliver estate in Pittsburg. The American Bridge Co. has a contract to erect a big bridge for the Louisville & Nashville railroad. Several other large jobs are in sight, but have not been closed.

No business in structural material for the permanent rebuilding of San Francisco has been placed, although the demand from that district for merchant pipe under 4-inch diameter and galvanized roofing and nails for temporary structures has been very heavy and material has been rushed forward. Representatives of the steel corporation on the ground report that in their opinion even the one, two and three-story business houses will be of steel when they are rebuilt.

In semi-finished material the scarcity of sheet bars is becoming more pronounced, and on account of taking the Mingo plant of the corporation off sheet bars and placing it on small billets, due to placing the entire Ohio works at Youngstown, on rails, the scarcity will be even more pronounced than at present. The American Sheet & Tin Plate Co. has at least three mills shut down entirely on account of inability to get sheet bars, and several independent mills have been compelled to curtail their output.

Western railroads have placed heavy orders for steel rails for 1907 delivery, and are getting in on the $28 price, Chicago, realizing that after the Illinois Steel Co. is filled for the year they will have to pay $28 Pittsburg with the added freight to destination. Local mills still have considerable capacity for 1906 delivery, but 90,000 tons for next year will probably be taken this week.

Pig Iron.—There has been a big inquiry for basic pig iron and considerable business will be closed within the next two weeks. Some has already been placed at $17 valley. Bessemer is strong at $17.25 for large tonnage and $17.50 for medium and small tonnages. Although there have been no sales of importance since the corporation took all the Bessemer the association had for May, there is a feeling that unless the strike of dock workers at Lake Erie receiving ports is settled soon, Bessemer pig iron will be exceedingly scarce, as several of the furnaces are almost entirely out of high grade ores. No. 2 northern foundry is quoted $16.75 to $17 valley furnaces, and gray forge is quoted $16.50 to $16.60, delivered Pittsburg. We quote:

Bessemer Valley	$17.25 to 17.50
Bessemer, Pittsburg	18.10 to 18.35
No. 1 Foundry, Pittsburg	18.00 to 18.12
No. 2 Foundry, Pittsburg	17.60 to 17.85
Gray Forge, Pittsburg	16.50 to 16.60
Basic, Valley	17.00 to 17.20
Basic, Pittsburg	17.85 to 18.56

Ferro-Manganese.—Quotations on ferro-manganese, foreign 80 per cent are considerable of a problem. While representatives of some of the seaboard importers are quoting $95 to $100, Pittsburg, for prompt shipment, one New York interest has quoted $76 for July delivery at Pittsburg.

Steel Billets.—There has been a scarcity of semi-finished steel and the market for some time past has been $27 delivered Pittsburg, but during the past week a considerable tonnage was sold at $26.50 and the producer has more at the same price. Sheet bars are exceedingly scarce and on new contracts are being held firmly at $28.

Skelp.—Neither conditions nor prices have changed since the last report and we continue to quote as follows:

Bessemer grooved, 1.57½c to 1.60c; sheared, 1.65c to 1.70c; basic grooved, 1.60c to 1.65c; sheared, 1.65c to 1.70c; iron skelp, grooved, 1.65c to 1.70c; sheared, 1.80c to 1.85c.

Hoops and Bands.—Specifications on old contracts are coming in freely and there has been no change in prices. We continue to quote as follows:

Hoops, 1.90c in carload lots, and 2c on less than carload lots, bands, 1.50c base, half extras as per standard steel card. Prices f. o. b. Pittsburg.

Cotton Ties.—With the first rush of business in connection with the opening of the market last month over, the April price of 85c per bundle has been advanced to 85½c and for June the leading interest will make a further advance of ½c.

Muck Bar.—We quote a nominal price of $29 for all pig metal muck bar, although this market has been exceedingly quiet and there have been no new transactions upon which to base a price. Consumers are pretty well covered for some time to come.

Structural Material.—The McClintic-Marshall Construction Co. has taken a contract for the new open-hearth furnace building of the Bethlehem Steel Co., at South Bethlehem, Pa., taking about 5,000 tons, and a 600-ton building for S. Jarvis Adams Co., at Midland, Pa.; the Riter-Conley Co. has received the contract for the steel work construction of four 600-ton furnaces at the new Gary, Ind. plant of the steel corporation; the John Eichlaey Jr. Co. has a contract for a new building for the Oliver estate, Pittsburg. The amount of building business under way or contemplated is enormous, and is strongly reflected by the inquiries made upon mills for material. Orders are holding up well and there has been no change in prices. We continue to quote:

Beams and channels, 15 in., and under, 1.70c; over 15 in., 1.80c; zees, 1.70c; tees, 1.75c; angles from three to six inches, inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.60c base.

Plates.—The demand for sheared plates has improved slightly and is now

firm. There is a very heavy demand for the narrow sizes of universal plates used in columns, girders and steel car construction. While confirmation cannot be secured here, it is reported from Philadelphia that the Pennsylvania lines have closed with steel car companies for 20,000 cars for 1907 delivery. The Pressed Steel Car Co. has secured a contract for 700 hopper cars of 100,000 pounds capacity from the Western Maryland road. There has been no lake business except the small tonnages required for repair work. Reports of price shading in the east have not affected this market. We quote:

inches, 1.60c f. o. b. mill, Pittsburg. Extras are as follows per 100 pounds, boiler and flange steel plates, .10c; A. B. M. A. and ordinary firebox steel plates, .20c; still bottom steel, .30c; marine steel, .40c; locomotive firebox steel, .50c; all sketches excepting straight taper plates, varying not more than four inches, in width at ends, narrowest end not being less than 30 inches, .10c, complete circles, .20c. Plates in width over 100 inches up to 110 inches, .05c; over 110 inches up to 115 inches, .10c; over 115 inches up to 120 inches, .15c; over 120 inches up to 125 inches, 25c; over 125 inches up to 130 inches, .50c; over 130 inches, 1.00c. Gauges under ¼ inch to and including 3-16 inch plates on thin edges, .10c; under 3-16 inch to and including No. 8, .15c; under No. 8 to and including No. 9, .25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Rails and Track Material.—The first big inquiry, which amounts to 90,000 tons for 1907 delivery, is now out and will probably be closed some time during the present week. To date no business for next year has been placed with the local mills. The western roads are reported, however, to have placed heavy orders with western mills in order to avoid the rush, knowing that they can place the business at $28 Chicago as long as those mills have capacity open, but that after that time they would have to pay $28 Pittsburg with the additional freight to points of delivery. Among the heavy sales by local mills during the week were 15,000 tons for the Chesapeake & Ohio; 10,000 tons for the Big Four, and 9,500 tons for the Pittsburg, Binghampton & Eastern, these for delivery during the present year. Local mills still have considerable capacity for 1906 delivery. We quote:

Fifty pounds and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails, 16 pounds, $30; 20 pounds, $28.50 to $29; 25 to 45 pounds, $29; angle bars for standard sections, 1.50c; spikes, $2.05 to $2.10.

Merchant Bars.—Prices remain unchanged at 1.55c for Pittsburg delivery and the basing price for western shipment at 1.50c. Considerable business has been done during the week at these prices and producers are looking for better conditions. We quote:

Common iron bars, 1.55c, Pittsburg in carload lots, 1.65c in less than carloads; for western shipment 1.50c base Pittsburg; Bessemer steel bars, 1.50c; open-hearth steel bars, 1.50c; plow and cultivator, 1.50c net; channels, angles, zees and tees, under 3 inches, 1.60c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds .10c advance, less than 1,000 pounds, of a size, .30c advance.

Merchant Steel.—The new business is far in excess to the shipments and this is a very healthy indication of conditions. There is still considerable business to be placed by the implement manufacturers and the $1.50 base is being firmly maintained. We quote:

Cold rolled and ground shafting, 50 per cent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.70c to 1.80c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.05c to 2.10c. The price of planished and machine straightened tire is 1.70c base half extras as below. Iron finished tire up to 1½ inch by ½ inch 1.65c base half extra tire list. Iron finished tire 1½inch by ½ inch and over to be sold on regular bar basis of 1.50c base, half extra steel card.

Wire and Wire Nails.—The demand for fence wire, barbed wire and wire nails is very heavy, and for the latter the amount of business has in particular shown an increase, and prices all along the line are being well maintained. Jobbers and dealers are specifying freely to replenish their stocks which have been low for some time past. We quote:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90, and less than carload lots, $2; painted barb wire, $2 for jobbers in carloads; retailers in carloads, $2.05, and less than carloads, $2.15, with 30c for galvanizing, plain wire $1.70 to jobbers and $1.75 by carload.

Sheets.—The specifications for sheets on old contracts are very heavy, but new business is light. The scarcity of sheet bars is being felt to a greater extent than at any time since the present scarcity began to be apparent. From this time on it will be even worse, as the Mingo mill of the Carnegie Co., which has been making sheet bars has been put on small billets, due to the demand for rails which made it necessary to devote the entire Ohio works at Youngstown to rails. The demand for galvanized roofing at San Francisco has been very heavy, and since May 1 it is estimated that 8,000 tons have been shipped to be used in temporary construction work. The leading producer of sheet bars estimates that it is turning out only between 50 and 60 per cent of the requirements. The American Sheet & Tin Plate Co. has shut down about 15 per cent of its sheet mills on this account alone, Mercer being off altogether, and two other mills are out on account of scarcity of sheet bars. Independent mills have been compelled to curtail their output on this account. We quote:

Black steel sheets, box annealed, cold rolled, one pass: Nos. 11-12, 2c; Nos. 13-14, 2.05c; Nos. 15-16, 2.10c; Nos. 17-21, 2.15c; Nos. 22-24, 2.20c; Nos. 25-26, 2.25c; No. 27, 2.30c; No. 28, 2.40c. Galvanized, Nos. 10-11, 2.35c; Nos. 12-14, 2.45c; Nos. 15-16, 2.55c; Nos. 17-21, 2.70c; Nos. 22-24, 2.85c; Nos. 25-26, 3.05c; No. 27, 3.25c; No. 28, 3.45c. Corrugated roofing, $1.70 per square for No. 28 painted, 2½-inch corrugation; $3.05 per square for No. 28 galvanized, 2½-inch corrugation. Quotations f. o. b. Pittsburg on large lots.

Tin Plate.—The leading producer now has contracts for about all the business it cares to assume at this time, having filled up until about August 1 before the recent advance in price. Independent mills are busy, but have been hampered by the scarcity of steel.

We quote: $3.60 per base box, f. o. b. Pittsburg, 14 x 20 100-pound cokes, terms 30 days, less two per cent off for cash in ten days.

Merchant Pipe.—Considerable business has been done during the past week, but market conditions have not improved and the extreme discount on merchant pipe is 81 per cent and 5 off. More San Francisco business for the smaller sizes, 4 inch and under, has been placed. The order for 1,200 tons mentioned last week, was received on Saturday, a week ago, and was all on the way to the coast by the following Monday. Sixteen days is the best time that can be made from Pittsburg to San Francisco. The line pipe inquiries which have been out for several weeks have not resulted, as far as can be learned, in any contracts being placed. The Export Products Co. recently closed a good sized transaction with Canadian interests. We quote pipe, consumers' carloads, with jobbers' carloads one point higher, subject to above mentioned discounts.

	Steel		Iron	
Consumer's Carloads	Black	Galv.	Black	Galv.
⅛ and ¼ inch	71	55	67⅚	51⅚
⅜ inch	73	59	69⅓	55⅓
½ inch	75	63	71⅓	59⅓
¾ to 6 inches	79	69	76	66
7 to 12 inches	74	59	71	55⅓
EXTRA STRONG PLAIN ENDS.				
⅛ to ¾ inch	64	52	60⅓	48⅓
½ to 4 inches	71	59	67⅓	55⅓
4½ to 8 inches	67	55	63⅓	51⅓
Double extra strong plain ends, ⅛ to 8 inches	60	49	56⅓	45⅓

Boiler Tubes.—The recent heavy shading of quoted prices has resulted in considerable business being placed during the past two weeks. While the official quotations have not been changed, they are being generally shaded four points. Locomotive boiler tubes are still in strong demand and the new business is good, but aside from this one line the pipe market is not active and prices are low. The official prices, which are being shaded as mentioned, are as follows, on merchant boiler tubes 22 feet and under, consumers' carloads:

	Steel	Iron
1 to 1⅛ inches	46	41
1¼ to 2¼ inches	58	41
2½ inches	60	46
2¾ to 5 inches	66	53
6 to 13 inches	58	41

Less than carload lots two points less.
2¼ inches and smaller, over 18 feet, 10 per cent net extra.
2¾ inches and larger, over 22 feet, 10 per cent net extra.

Old Material.—There has been a little buying during the week under review, but conditions in the scrap market are still bad and prices are low. We quote, Pittsburg, freight rate to be added to point of delivery: Heavy melting stock, $15 to $15.50; old steel rails, re-rollers, $15.50 to $15.75; No. 1 cast scrap, $15 to $15.50; cast borings, $8.75 to $9; bundled sheet scrap, $13.50; No. 1 railroad wrought, $17 to $17.25; No. 1 yard faggoting scrap, $17; low phosphorus scrap, $18 to $18.50; wrought turnings, $11 to $11.50; busheling scrap, $14 to $14.50; iron axles $25 to $26.

Coke.—With the settlement of the anthracite coal strike, coke prices took a sharp downward turn and standard Connellsville foundry coke is now quoted $2.75 to $2.85, ovens and furnace coke, $2.65 to $2.85. The estimated production of the Connellsville region for the week ending April 26 was 272,342 tons and for the lower Connellsville region, 102,640 tons.

CHICAGO.

Large Consumers Most Active.—Pig Iron Market is Soft.—Many Inquiries.

Office of *The Iron Trade Review*.
1164 Monadnock Block, May 8

Large consumers of iron and steel products are doing the bulk of the trading at the present time. This includes railroads which are contracting freely for standard sections for 1907 delivery and heavy melters of pig iron, who have bought liberally for deliveries extending to the first of the year. The Illinois Steel Co. has booked about 150,000 tons of rails for next year's shipment, and is negotiating for an equal tonnage with other roads. The principal feature of the pig iron market is its softness. The northern product is especially sensitive to outside influences, all grades having declined in value in the last two weeks. Sales of southern iron are likewise being made at less than the published schedule of $14 Birmingham for No. 2 foundry, several lots having been taken at $13.75. Cutting of prices has also developed in boiler tubes, the erstwhile "official" schedule being shaded from $4 to $6 a ton. The prevailing price of 1.66½c for bar iron was reaffirmed at a meeting of manufacturers last week. There is a brisk demand for this product, and sales are now being made for deliveries extending into the last half. Steel bars are quiet, those consumers not yet covered being disinclined to pay the higher price asked by mills. New tonnage and specifications for heavy plates are slow in coming forward, the local mill not having more than a month's output on its books. Scrap is slow to gain strength, the large offerings of railroads preventing any marked movement upward.

Pig Iron.—Western consumers have closed for round lots of iron in the last ten days. Malleable and charcoal sales are the most conspicuous from the standpoint of tonnage, approximately 15,000 tons of the former, and 5,000 tons of the latter having been booked by furnaces. The Grand Crossing Tack Co., Inland Steel Co., and the American Steel Foundries have also bought in the aggregate between 10,000 and 12,000 tons of basic, but neither interest contracted for the full amount of its inquiry. There has also been a fair sprinkling of orders for nothern and southern foundry irons, though this tonnage is not of noteworthy proportions. The susceptibility of the local market to outside pressure is very noticeable. Western furnaces have met the eastern competition on malleable Bessemer, and orders are being accepted on the basis of $18.20 to $18.30 Chicago, which is a drop of 70 cents to 80 cents from the price ruling early last month. Lake Superior charcoal has declined $1 a ton in the same period and is now quoted at $19 Chicago. Northern foundry grades range from $18.30 to $18.75 Chicago, according to the delivery required, though more of the former iron is being placed than the latter. Basic is selling at a maximum of $19 Chicago for the valley product, and $18.85 Chicago for the Virginia output. Southern irons are not any stronger than the northern product, frequent sales being made on the basis of $13.75 Birmingham for No. 2 foundry. Some large inquiries are pending, but before they are closed still lower prices are expected to be brought out. The National Malleable Iron Co. was figuring last week on a tonnage understood to be in five figures. It purchased only one or two thousand tons, and is awaiting better prices on its larger requirements. Negotiations with the International Harvester Co. are still in the primary stage, but the company is ready to buy a large tonnage as soon as a price meeting its views is made. A Wisconsin malleable interest is also negotiating with furnaces on a contract calling for 75,000 tons of charcoal and malleable irons, the deliveries on same to extend over a period of five years.

Our quotations are as follows:

Lake Superior charcoal	$19.00 to 19.25
Northern Foundry No. 1	19.25 to 19.75
Northern Foundry No. 2	18.75 to 19.00
Northern Foundry No. 3	18.25 to 18.75
Northern Scotch Foundry	19.25 to 19.75
Ohio Strong Softeners No. 1	19.50 to 19.55
Ohio Strong Softeners No. 2	18.80 to 19.05
Southern Foundry No. 1	18.25 to 18.40
Southern Foundry No. 2	17.65 to 17.90
Southern Foundry No. 3	17.15 to 17.40
Southern Foundry No. 4	16.65 to 16.90
Southern No. 1 Soft	18.25 to 18.40
Southern No. 2 Soft	17.65 to 17.90
Southern Gray Forge	16.15 to 16.40
Southern Mottled	15.90 to 16.15
Southern Silveries (4 percent to 6 percent Silicon)	18.15 to 18.65
Jackson Co. Silveries, 8 to 10 percent Silicon	23.30 to 24.30
Alabama and Georgia Car Wheel	22.65
Malleable Bessemer	18.30 to 18.75
Basic Iron	18.40 to 18.85

Billets and Rods.—Demand for crude steel is good. The specifications of the week past include one lot of 1,000 tons of open-hearth rolling billets for July delivery on an eastern mill. Forging billets are firm at $35 Chicago Some irregularity exists in rods, an eastern independent mill offering same at $35 Chicago, which is $1 below the price asked by the American Steel & Wire Co.

Iron and Steel Bars.—There is an active inquiry for railroad cars, and a brisk demand for bar iron is expected to follow the placing of these orders. Among the railroads in the market for new equipment are the New York Central which is figuring on 26,000 cars, Pennsylvania, 23,000 cars and the Burlington, 2,000 cars. Bar iron is still firm at 1.66½c Chicago, and contracting for the third quarter is proceeding at a gratifying pace. The principal transaction in steel bars this week is the renewal for another year of the conversion arrangement between the International Harvester Co. and the Interstate Iron & Steel Co., both of this city. The tonnage to be rolled by the latter interest for the implement manufacturer during the coming year is about one-half less than that of the year past, amounting to between 15,000 and 20,000 tons. New business for steel bars continues light, though specifications are active. We quote carload lots Chicago delivery, as follows:

Bar iron, 1.66½c; soft steel bars and bands, 1.66½c half extras; soft steel angles, less than 3 x 3, 1.76½c; hoops, 2.06½c base, full extras; old rail stock, 1.65½c. There is a good movement from local warehouses and jobbers' prices are firm. We quote bar

iron, 2.10c full extras; soft steel rounds and squares, 3 inches and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by 1⅛-inch and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by 1⅛-inch and larger, $2 per 100 pounds base; flats, 4½ inches x 5 inches and 6 inches x 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands, $1.85 to $1.95 half extras; soft steel hoops, $2.30 to $2.40 full extras. Other sizes not mentioned above, $1.85 per 100 pounds base, plus half extras.

Sheets.—It is exceedingly difficult to get early deliveries of black or galvanized sheets. All the mills are carrying large tonnages on their books and specifications are very heavy. Twelve weeks is the best that the local mill can do on galvanized, and eight weeks' time is required for shipment of black sheets. New tonnage is coming into the market at a fair rate. Quotations are firm, the only concession allowed being the $1 rebate from the official price list. We quote mill shipments, Chicago delivery, as follows:

Nos. 8, 9 and 10, 1.86½c; Nos. 11 and 12, 1.91½c; Nos. 13 and 14, 1.96½c; Nos. 15 and 16, 2.06½c. Box annealed, Nos. 18 and 20, 2.26½c; Nos 22 and 24, 2.36½c; No. 26, 2.41½c; No. 27, 2.46½c; No. 28, 2.56½c; No. 29, 2.71½c; No. 30, 2.81½c. Jobbers' prices on less than carload lots are as follows: No. 10, 2.20c; No. 12, 2.25c; No. 14, 2.30c; No. 16, 2.40c; Nos. 18 and 20, 2.55c; Nos. 22 and 24, 2.60c; No. 26, 2.65c; No. 27, 2.70c; No. 28, 2.75c; No. 30, 3.20c.

Quotations on galvanized sheets, carload lots, mill shipments, are as follows: Nos. 10 and 11, 2.46½c to 2.51½c; Nos. 17-21, 2.81½c to 2.86½c; Nos. 22-24, 2.96½c to 3.01½c; Nos. 25-26, 3.16½c to 3.21½c; No. 27, 3.36½c to 3.41½c; No. 28, 3.56½c to 3.61½c; No. 29, 3.81½c to 3.86½c; No. 30, 4.06½c to 4.11½c. From store, galvanized sheets, less than carload lots, are quoted as follows: Nos. 10 to 20, 3c to 3.10c; Nos. 22 and 24, 3.15c to 3.25c; No. 26, 3.35c to 3.45c; No. 27. 3.55c to 3.65c; No. 28, 3.75c to 3.85c; No. 30, 4.95c to 5c.

Merchant Steel.—Quite a number of season contracts for the agricultural shapes listed below have been placed in the week under review. Specifications are also of good volume, and prices are firm. We quote mill shipments, Chicago delivery, as follows:

Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c to 2.40c; smooth finished machinery steel, 1.91½c; smooth finished tire, 1.86½c base; plow steel, 2.20c and upward, according to quality; toe calk steel, 2.21c; railway spring, 1.86½c. Cold rolled shafting, 50 per cent off in carload lots and 45 per cent in less than carload lots. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and up.

Plates.—The demand for light plates is especially brisk, the best delivery obtainable from local makers being fourteen weeks. New tonnage is not so encouraging on sheared plates, however, western mills being able to promise delivery within four weeks. Store trade is brisk, jobbers' quotations being held firmly to the schedule given below. We quote mill shipments, Chicago delivery, as follows:

Tank steel, ¼ inch and heavier, up to 100 inches wide, 1.76½c base; flange steel, 1.86½c base; marine steel, 1.96½c base; all full extras. Plates 3-16 inch thick, $2 extra; gauges, 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. We quote from local stocks; tank steel ¼ inch and heavier, up to 72 inches wide, 2c to 2.10c; 72 inches to 96 inches wide, 2.10c to 2.20c; 3-16 inch up to and including 60 inches wide, 2.10c to 2.20c; 3-16 inch 72 inches wide, 2.35c to 2.45c; No. 8, up to 60 inches wide, 2.15c to 2.25c; flange steel, 25c extra; heads, 25c extra.

Rails and Track Supplies.—Several large orders for standard sections for 1907 delivery have been closed by the Illinois Steel Co., since this interest opened its books for that year, the whole aggregating a round tonnage. There are also several round lots pending. Demand for light rails is good, the local mill now selling for deliveries throughout the entire last half. Track supplies are also moving briskly, the Republic Iron & Steel Co. having advanced its quotation on spikes to 2.15c East St. Louis, after having closed several thousand tons in the past week at 2.10c.

We quote, standard sections, f. o. b. mill, open-hearth rails, $29; Bessemer, $28; light rails, Bessemer steel, 30 to 45-pound sections, $27 to $28, 25-pound, $28 to $29; 20-pound, $29 to $30; 16-pound, $30 to $31; 12-pound $31 to $32, and light sections down to 8-pound, $38 to $40, all f. o. b. mill. Track supplies are quoted as follows: angle bars, 1.50c to 1.75c; spikes, (for quick shipment) 2.15c to 2.25c; (for forward deliveries) 2.05c to 2.10c; track bolts, 2.65c to 2.75c, base square nuts.

Cast Iron Pipe.—Municipal contracts for cast iron pipe placed this week aggregate 1,000 tons, including 400 tons for Mayville, Wis., and between 500 and 600 tons for Albia, Ia. It transpires that the bulk of the 10,000 tons of pipe being figured on by the city of New Orleans and which will be let on the 15th of this month will be for small sizes. Routine business keeps up well. Prices are without change, as follows: 4-inch water pipe, $31 Chicago; 6, 8, 10 and 12-inch, $30; larger sizes, $29.50; gas pipe, $1 extra.

Merchant Pipe.—The local market is quiet. The irregularity in prices reported elsewhere is not noted here. Quotations are firm on the following basis: For ¾ to 6-inch black steel pipe, 78.35 per cent discount from list, and galvanized, 68.35 per cent discount. From store, minimum quotations are 76½ to 77 per cent discount on the base sizes, ¾ to 6-inch black steel pipe.

Boiler Tubes.—Considerable irregularity exists in boiler tubes and "official" prices are being shaded from $4 to $6 a ton. The following discounts are said to have been adopted by the association, although the leading interest affirms it has not yet changed its schedule. They are, however, being quoted by other makers.

	Steel	Iron	Seamless
1 to 1¼ inches	46.35	43.35	53.35
1⅜ to 2¼ inches	58.35	43.35	40.35
2½ inches	60.35	48.35	43.35
2¾ to 5 inches	68.35	55.35	
2¾ to 4½ inches (Seamless)			50.85
6 to 13 inches	58.35	43.35	

Less than carload lots, from store, as follows:

	Steel	Iron	Seamless Steel
1 to 1¼ inches inclusive	40	35	42½
1⅜ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	30
2¾ to 5 inches, inclusive	60	47½	42½

Wire Products.—The principal feature of the week's trade is the large quantity of nails being shipped to San Francisco, the consignments of the American Steel & Wire Co. alone for last week amounting to 50,000 kegs. There is a brisk demand for smooth wire, barbed and open fencing, but it is not as heavy as it was a month ago. The business of the American Steel & Wire Co. for April exceeded that of any previous month in its history. There are no stocks on hand worthy the name either at mills or in dealers' warehouses, and the entire output of the country is being applied to the replenishment of denuded piles in anticipation of a brisk demand later in the summer. The manufacturing trade is very heavy at this time, large purchases having been made for consumption in electrical specialties. Prices are very firm, but without change. We quote carload lots to jobbers, Chicago delivery, as follows:

Wire nails, $2; painted barbed wire $2.15; galvanized barbed wire, $2.45; smooth annealed wire, $1.85; smooth galvanized wire, $2.15; polished staples, $2.15; galvanized staples, $2.40. Carload lots to retailers, 5 cents higher

than above prices; less than carload lots, 15 cents higher.

Coke.—The coke market is still soft. The molders' strike has scarcely affected the local situation, Chicago foundrymen generally being well covered both for immediate and future wants. Demurrage coke is daily offered here, and is an active bar to the establishment of fixed prices. For spot shipment, Connellsville 72-hour brands are being offered around $5 Chicago, from 25 to 50 cents a ton higher being asked on contracts for forward delivery. By-product coke is strong at $5.75 Chicago.

Structural Steel.—The only transaction of interest this week is the letting of the general contract for the erection of the Maison Blanche department store in New Orleans, which was placed with James T. Stewart & Co., of St. Louis. The contract for the steel work, which amounts to about 6,000 tons, has not yet been closed. Specifications for structural material are of an active nature. There is a brisk demand for fabricated bridge material from railroads, the Louisville & Nashville having bought about 1,500 tons in the week under review. Local store trade is heavy; jobbers also report some difficulty in keeping their stocks replenished. We quote carload lots, mill shipments, Chicago delivery, as follows:

Beams and channels, 3 to 15 inches, inclusive, 1.86½c; angles, 3 to 6 inches, 1.86½c; angles, larger than 6 inches, on one or both legs, 1.96½c; beams, larger than 15 inches, 1.96½c; zees, 3 inches and over, 1.86½c; tees, 3 inches and over, 1.91½c, with the usual extras for cutting to exact lengths, punching, coping, bending, or other shop work.

Quotations on lots from store are as follows: All angles three inches and larger, including six inches, $2.25 per 100 pounds base; angles over six inches, $2.35 per 100 pounds base; tees, three inches and larger, $2.30 per 100 pounds base; beams, three inches to fifteen inches, inclusive, $2.25 per 100 pounds base; beams, eighteen inches and larger, $2.35 per 100 pounds base; channels, three inches and larger, $2.25 per 100 pounds base.

Old Material.—The local market is a little more active, if anything, than it has been for several weeks past. Trading, however, is almost wholly confined to dealers, who are buying up odd car lots to complete old contracts. Bar iron mills, generally speaking, are well protected for the next few months and are only interested in new offerings of scrap when attractive prices are made. Open-hearth plants have bought the most freely of local consumers, but these interests are quiet just now. There is a scarcity of cast scrap and prices of this material are firm. The offerings this week by western railroads are heavy, including 3,100 tons by the Santa Fe, 350 tons by the Wisconsin Central; 1,900 tons by the C. M. & St. P.; and 1,100 tons by the C. St. P. M. & O. We have revised several of our prices, and quote as follows, gross tons being given in the first paragraph:

Old Steel Rails (4 feet and over)	$16.25 to 16.75
Old Steel Rails (less than 4 feet)	15.25 to 15.50
Old Car Wheels	18.50 to 19.00
Old Iron Rails	21.00 to 21.50
Relaying Rails, subject to inspection	27.00 to 27.50
Heavy Melting Steel	13.50 to 14.00
Mixed Country Steel	11.50 to 12.00

We quote as follows net tons:

No. 1 R. R. Wrought	$15.00 to 15.50
No. 2 R. R. Wrought	14.00 to 14.50
Shafting	16.00 to 16.50
Dealers' Forge No. 1	12.50 to 13.00
Wrought Pipe and Flues	10.50 to 10.75
No. 1 Cast, 150 pounds and less	13.25 to 13.75
No. 1 Mill	9.50 to 9.75
No. 1 Busheling	10.00 to 10.50
No. 2 Busheling	9.50 to 10.00
Country Sheet	8.00 to 8.50
No. 1 Boilers Cut	10.00 to 10.50
Boiler Punchings	12.00 to 12.50
Iron Car Axles	23.50 to 24.00
Steel Car Axles	19.00 to 20.00
Iron Axle Turnings	10.50 to 11.00
Cast Borings	9.25 to 9.50
Mixed Borings, etc.	9.25 to 9.50
Machine Shop Turnings	10.75 to 11.00
Railroad Malleable	13.50 to 14.00
Agricultural Malleable	12.50 to 13.00
Stove Plate and Light Cast Scrap	10.50 to 11.00
Old Iron Splice Bars	16.50 to 17.00

CLEVELAND.

April Ore Shipments Heavy.—Longshoremen's Strike Apparently Near an End.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, May 8.

Iron Ore.—Accurate returns of ore shipments from upper lake ports for April show a total of 1,447,386 tons, as compared with 1,195,173 tons in April, 1905. This is an increase of 21.1 per cent. By ports the shipments were as follows:

	April 1906	Percent. of total	April 1906	Percent. of total
Escanaba	253,299	21.19	243,254	16.81
Marquette	104,279	8.72	85,216	5.89
Ashland	61,697	5.16	134,302	9.28
Superior	190,703	15.96	210,263	14.53
Duluth	263,842	22.08	383,643	26.50
Two Harbors	321,353	26.89	390,708	26.99
	1,195,173	100.00	1,447,386	100.00

The shipments which started at such a remarkable rate, however, will show a marked decrease during the present month because of the continued strike of the longshoremen which so far has effectively tied up operations at all union manned docks on the lakes. Developments of the present week, however, indicate that this strike is to be short-lived and that the middle of the month will probably see a complete resumption of activities. The ridiculous failure of the longshoremen to bring out the members of the mates' union, in whose behalf they are striking has caused widespread dissatisfaction among the idle dock hands and from present appearances the strike will end through their voluntarily returning to work. More than a dozen non-union docks are in operation along the lower lakes with an estimated capacity of almost one-third of the total dock capacity of the lower lakes. This relief, together with the large amounts of ore stored in anticipation of the strike, is carrying furnaces well, and practically no distress will be suffered before June 1, while in many cases they can operate without difficulty for twice that period. This is considerably longer than the strike will be allowed to continue, so that there is no likelihood of iron production being seriously diminished through lack of ore. No sales have been reported during the past week and prices are nominal on the basis of $4.25 Old Range Bessemer.

Pig Iron.—With the prices of foundry irons settled on a lower level than that prevailing during the early spring, buyers have entered the market in greater numbers and brisk business is reported. While the past week developed no unusually large sales, the aggregate of small lots placed was heavy. Consumers are covering their requirements for the third quarter, and in many instances through the second half of the year, and one interesting case has come to light where a moderate tonnage was purchased for fourth quarter delivery, the purchaser stating that he intended to use it during the first quarter of 1907. For foundry iron $16.25 valley furnace is being secured, with $16.75 the regular Cleveland quotation. A sale of 5,000 tons malleable iron is reported. In basic local furnaces are well covered through the second half, and are not solicitng business. The settlement of the anthracite strike has weakened coke quotations, which are now $2.40 to $2.60 for furnace and $2.80 for foundry coke. We quote Cleveland delivery as follows:

Bessemer	$18.10 to 18.35
No. 1 Foundry	17.25 to 17.50
No. 2 Foundry	16.75
No. 3 Foundry	16.25 to 16.50
No. 2 Southern	17.85 to 18.10
Gray Forge	16.35 to 16.85
Gray Forge, Southern	15.85 to 16.35
Lake Superior charcoal	19.50 to 20.00

Finished Material.—Fewer new orders for structural materials are reported, but specifications on old contracts are keeping the mills busy. Sheets continue strong, and certain independent mills which have been giving prompt delivery are now unable to do so. Plates are reported brisk, but can be had for early shipment. Iron and steel bars are unchanged from quotations of a week ago, and the local market is doing nothing in the billet line.

Old Materials.—The scrap situation is thoroughly quiet, with mills buying

occasionally, but at their own prices. This with a few small transactions between dealers makes up the current business. Prices are on the same level as a week ago. We quote, Cleveland delivery, as follows:

Old iron rails	$21.00 to 22.00
Old steel rails (over 6 feet)	16.50 to 17.00
Old steel rails (under 6 feet)	16.50 to 17.50
Old car wheels	16.50 to 16.75
Steel boiler plate	12.00 to 13.00
Steel axles	19.00 to 20.00
Malleable iron (railroad)	14.50 to 15.00
Malleable iron (agricultural)	12.50 to 13.00
Heavy steel	14.50 to 15.00
Country mixed steel	13.00 to 13.50

We quote net tons, as follows:

No. 1 R. R. wrought	15.50 to 16.00
No. 1 busheling	12.00 to 12.50
No. 1 machine cast	13.25 to 13.70
Iron axles	22.00 to 23.00
Axle turnings	11.00 to 12.00
Wrought turnings (free from cast)	9.50 to 10.00
Grate bars	9.50 to 10.00
Pipes and flues	11.50 to 12.00
Tank iron	10.50 to 11.00
Hoop and band iron	7.50 to 8.00
Sheet iron	6.50 to 7.00
Wrought drillings	9.50 to 10.00
Stove plate	10.00 to 10.50
Cast borings	7.50 to 8.00

CINCINNATI.

Market More Active and Buyers and Sellers Seem Satisfied with Prices.

May 8.

Pig Iron.—The market has been slightly more active the past week and while there are but few transactions of magnitude reported, the general run of orders has been quite satisfactory. Most of the business has been for prompt shipment or second quarter delivery. One sale of high silicon southern iron covering one thousand tons for second half delivery was reported. Pipe makers have bought some moderate tonnages. There is a good demand for basic and some fairly large sales have been made. Prices have not changed and southern iron remains steady at $13.75 to $14.00 Birmingham while northern iron is quoted at $16.00 furnace for No. 2 as a minimum.

Buyers are not contesting present values and evidently the selling interests are willing to accept business at prevailing prices with freedom. There seem to be more orders coming forward for iron for prompt shipment, which indicates that melters are running low. There is hesitancy about covering for the second half of the year and to some extent it is believed that the recent monetary situation and the declines in the stock market have had some influence in this direction. Reports of consumption keep up right along and it is evident that melters are still consuming freely.

It was reported rather freely in the trade that a sale had been made to a concern in northern Ohio of southern iron at $13.50 Birmingham for No. 2 foundry. So far as we can learn $13.75 on southern product is minimum. We quote f. o. b. Cincinnati as follows:

Southern Foundry No. 1	$17.25 to 17.50
Southern Foundry No. 2	16.75 to 17.00
Southern Foundry No. 3	16.25 to 16.50
Southern Foundry No. 4	15.75 to 16.00
Southern Foundry No. 1, soft	17.25 to 17.50
Southern Foundry No. 2, soft	16.75 to 17.00
Gray Forge	14.75 to 15.00
Northern Foundry No. 1	17.65 to 18.15
Northern Foundry No. 2	17.15 to 17.65
Northern Foundry No. 3	16.65 to 17.15
Jackson County Silvery, 8 per cent	21.15 to 21.65
Southern Charcoal	22.75 to 23.25

Finished Material.—The market shows no change and continues active at previous prices for most lines. Bars rule quiet both iron and steel.

We quote: steel bars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets, No. 10 and No. 12, in car lots are 2.58c. We quote black sheets, No. 27 at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.85c; No. 27, 2.75c; No. 16, 2.35c; No. 14, 2.25c; No. 12, 2.15c. Tank plates are firm and sell out of store at 2c to 2.10c for ¼-inch and 2.10c for 3-16, Nos. 8 and 10. Beams and channels are quoted at 2.25c to 2.35c from stock and angles at 2.10c to 2.15c for base sizes.

In merchant pipe there is fair activity in the market, but on attractive business there is some competition. We quote f. o. b. Cincinnati:

MERCHANT PIPE.
(Basing Discounts)

	Steel Pipe		Guaranteed Wrought Iron Pipe	
	Black Per cent	Galv. Per cent	Black Per cent	Galv. Per cent
⅛ and ¼ inches	69.7	53.7	....	....
⅜ inch	73.5	61.3	....	....
½ inch	73.7	61.7	....	....
¾ to 6 inches	77.7	67.7	....	....
7 to 12 inches	72.7	57.7	....	....

Coke.—The market rules quiet and there is a slightly easier feeling. It is believed that the probable early settlement of the anthracite coal strike will have a tendency to cause buyers to defer order placing. In furnace coke there is some inquiry for second half of the year delivery and quotations are mainly on a sliding scale based on a $1.65 to $1.70 for $9.00 pig iron with a range of 16 2-3 to 20 per cent for each advance of $1.00 per ton on pig iron. Prices in the leading coke producing districts are as follows:

Wise County, Va. Furnace Coke prompt shipment	$2.50 per ton
Wise County, Va. Foundry Coke prompt shipment	3.00 to 3.25 per ton
Pocahontas Furnace Coke prompt shipment	$2.25 to 2.50 per ton
Pocahontas Foundry Coke on contracts	2.75 to 3.00 per ton
Connellsville Furnace Coke prompt shipment	2.50 per ton
Connellsville Foundry Coke prompt shipment	3.00 to 3.25 per ton
New River Foundry Coke on contracts or prompt shipment	3.00 to 3.25 per ton
New River Furnace Coke, prompt shipment	2.50 per ton

†Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices on the following basis: $1.65 per ton on $9.00 pig iron, plus 17 per cent of the advance on pig iron above $9.00 Birmingham

Old Material.—The market is firm in tone, but there is no quotable change in prices. We quote f. o. b. Cincinnati:

Old No. 1 railroad wrought, net tons	$14.00 to 14.50
Cast machine and foundry, net tons	12.50 to 13.00
Old iron rails, gross tons	20.00 to 20.50
Old steel rails, gross tons	15.50 to 16.00
Old short lengths, gross tons	16.00 to 17.00
Old iron axles, net tons	22.00 to 23.00
Stove plate, net tons	10.00 to 10.50
Wrought turnings, net tons	9.50 to 10.00
Cast borings, net tons	7.00 to 7.50
Car wheels, net tons	16.00 to 16.50

ST. LOUIS.

Heavy Demand for Shapes.—Strikes May Affect Pig Iron Market..

May 7.

There is still a feeling of hesitancy in the pig iron market, though it is somewhat improved over last week, when a threatened strike of the molders had a tendency to curtail buying orders. The strike has amounted to nothing in St. Louis, but it has been more serious in Belleville, Ill., and Kansas City, Mo. Iron men here have received word from both of these places to hold up on deliveries for the present. There are twelve active foundries at Belleville and fourteen at Kansas City, which consume between seven and eight thousand tons of pig a month. If they stay out of the market for any length of time it will naturally have a depressing effect locally.

While all large sales are made on a basis of $14 a ton f. o. b. Birmingham No. 2, there were further reports current of small lots of iron selling at $13.75 for immediate delivery. A few of the furnaces have gone out of blast, notably the Vanderbilt, and this is expected to check somewhat the cutting. Inquiries improve. One house is figuring on 10,000 tons of basic iron and the sale probably will be closed within the next two or three days. Other houses report prospects of good business.

Coke was quiet all week, few sales being reported. The price remained at $2.90 to $3.25 at Connellsville.

Iron quotations, including the freight rate of $3.50 to East St. Louis, are as follows:

Southern No. 1	$18.00 to 18.50
Southern No. 2	17.50 to 18.00
Southern No. 3	17.00 to 17.50
Southern No. 4	16.75 to 17.25
Gray Forge	16.50 to 17.00

Finished Material.—May 1 has passed without any strikes, except a few little individual disagreements, but there are threats of trouble ahead for June 1. On that date the structural steel and iron workers declare they will walk out unless their demand for an advance of 7½ cents an hour is met. It may be stated that the demand will not be met and if the structural workers stick by their guns a strike seems inevitable. Contractors generally scoff at the idea of a strike, however, de-

claring that the structural workers are merely trying to run a bluff on account of the big rush in building operations.

The Wagner Electric Mfg. Co. has completed plans for its new shops on the Wabash railroad and the contract for the steel, about 1,000 tons, is expected to be let daily. The M. K. & T. Ry. is taking bids for its new shops at Parsons, Kas. Brown-Ketchum, of Indianapolis, have the contract for the steel for the main building, but the contract for the other buildings, about 2,300 tons, has not been let. The contract for the building of the Income Leaseholders 18-story skyscraper on Fourth street, Pine to Chestnut, has been let to the Southern Illinois Construction Co. The contract for the steel, about 4,500 tons, will be awarded in the next few days. The American Bridge Co. has the contract for the 1,400 tons of steel for the Liggett building, 16 stories, at Eighth and Chestnut streets. James Stewart & Co. have the contract for the Maison Blanche department store building at New Orleans and will shortly let the contract for the steel, 6,500 tons.

The demand for merchant pipe is fairly active and prices rule about the same.

NEW YORK.

A Fairly Quiet Week in Pig Iron.—More Building Projects in New York.

OFFICE OF *The Iron Trade Review*, }
ROOM 1315, No. 150 NASSAU ST., May 7 }

Pig Iron.—There has been good routine buying and selling and the volume of inquiries is large, but prices are still ragged, especially on low grade foundry irons. The big tonnages, which were reported under negotiation last week, have all been held over, and during the past two days inquiries have become markedly less urgent. No doubt the news that there will be no strike in the anthracite coal field had something to do with this change of attitude, but the threatened difficulties have never been a serious factor in determining the course of the market in this locality at any time during the protracted negotiations. A sufficient supply of iron to keep the foundries in operation seems never to have been in doubt. Outside the regular purchases by consumers of favorite brands, the principal sales have been to manufacturers in New England. The largest buyer took 5,000 tons of foundry and there was another transaction involving 2,000 tons of No. 2 foundry. A lot of 400 tons of Alabama went to New England at a considerable concession from former prices. The current quotation for Alabama No. 2 is now rather a shade under $13.75, Birmingham, than $14 without differential of any kind. A number of small sales of Alabama and Virginia foundry grades were noted. On the whole, the sales to foundries have been near the average, although somewhat less than the preceding week. Including all grades the inquiries now in the market will probably aggregate 60,000 tons. A large proportion of this is from pipe manufacturers, and about 20,000 tons represents malleable iron, negotiations for which are still proceeding slowly. Deliveries are fairly satisfactory, although requests for shipment on old contracts continue urgent, which seems to show that supplies in some quarters are running low and that the total melt is still large. There have been no sales of basic in the local market and ferromanganese has attracted no attention. The following are prices current for pig iron at tidewater:

Northern No. 1 Foundry	$18.25 to 19.00
No. 2 Foundry	17.75 to 18.50
No. 2 Plain	17.50 to 18.00
No. 1 Southern Foundry	18.00 to 18.50
No. 2 Southern Foundry	17.50 to 18.00
No. 3 Southern Foundry	16.75 to 17.25
No. 4 Foundry	16.50 to 17.00

Warrants and Certificates.—There has been more activity in trading in pig iron warrants and certificates at the New York Produce Exchange than for some weeks past. The following sales were reported for the week ending Monday: 1,000 tons, regular May, $16.55; 300 tons, Dayton, No. 2 warrants, $13.30; and 100 tons June, regular, $16.60. The following are today's quotations for standard contracts and foundry iron warrants:

Standard Foundry Contracts.

	Bid.	Asked.
May	17.00	17.75
June	17.25	17.75
October	17.00	17.50

Foundry Warrants.

	Bid.	Asked.
Cash	16.40	16.60
May	16.50	16.60

Finished Iron and Steel.—The steel trade is interested in the Manhattan bridge muddle which now seems in a fair way to become untangled. Justice Garretson, in the supreme court at Long Island City, on Saturday, refused to grant a permanent injunction which would again tie up the work indefinitely, and the commissioner today opened the six bids submitted to him. The result appears elsewhere in the present issue. The present month promises to yield a large crop of orders for structural material, but thus far little has reached the contract stage. The projectors of a new building to be erected at Broadway and Cortlandt streets, this city, last week, succeeded in making the necessary financial arrangements to begin operations and requests for bids are expected shortly. Orders for the United States Steel Corporation plant at Gary, Ind., will probably be placed during the present month and the tonnage pending for bridges and terminals for railways in the east aggregate fully 40,000 tons. The American Bridge Co. has secured among others a contract for 1,500 tons of steel for the Savoy hotel and 500 tons for the building to be erected on the small plot of ground at the corner of Broadway and Wall streets. Purchases of rails for 1906 shipment for the week reach a total of more than 40,000 tons. These are given in detail elsewhere in this issue. An enormous tonnage for 1907 delivery is pending. Pipe dealers report a fair run of orders, and are interested in a big contract of pipe steel for the Brooklyn Water Works to be let on May 23. The material is for eight miles of 72-inch pipe, the skelp to be ⅝ inch and the total weight about 11,250 tons. Besides the pipe there will be needed fittings, etc. J. B. & J. M. Cornell have given an order for 360 tons of plates, all of the same dimensions, for the Astor apartment hotel to the Lukens Iron & Steel Co. There has been moderate buying of bar iron and the market has remained steady.

The following are prices at tidewater: Angles, 3 to 6 inches x ¼ inch and heavier, 1.84½c; beams, 3 to 15 inches, 1.84¼c; tees, 3 x ¼ inch and heavier, 1.89½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine boiler, 2.41½c; refined iron bars, 1.64½c to 1.74½c; soft steel bars, 1.64½c; sheets, No. 28 black, 2.40c.

Old Materials.—Conditions have again improved. Prices are still irregular, but are firm. Heavy steel scrap has been markedly active, inquiries being plentiful. At the beginning of the week a sale of 750 tons was reported at $17 delivered at the buyer's mill and at the close for the same delivery a lot of 300 tons brought $17.50. Cast scrap promises to be plentiful hereabout, but at present prices are firm. A sale of 1,000 tons of railroad wrought scrap is reported and stock is not offered freely. The following are prices approximately f. o. b. tidewater:

Old iron rails	$21.00 to 22.00
Old steel rails, long lengths	15.00 to 15.50
Old steel rails, short pieces	14.50 to 14.75
Relaying rails	24.00 to 25.00
Old car wheels	17.00 to 18.00
Old iron car axles	26.00 to 27.00
Old steel car axles	19.00 to 19.50
Heavy melting steel scrap	15.00 to 15.50
No. 1 railroad wrought scrap	18.00 to 19.00
Iron track scrap	17.00 to 17.50
Wrought pipe	12.50 to 13.50
Cast borings	10.00 to 10.50
Wrought turnings	13.50 to 14.00

STRUCTURAL STEEL BIDS

On Manhattan Bridge Much Lower than Last Year.—American Bridge Co. Bookings.

New York, May 6.—Bids for the construction of the Manhattan bridge were opened yesterday and proved a surprise in several ways. Three of the estimates are nearly a million dollars less than those of last year. The bids were to have been opened last week, but were held up by an injunction. The Pennsylvania Steel Co., which secured the contract some months ago on an award set aside by the courts, did not appear among the bidders. The following are the bids: American Bridge Co., $8,312,146; John Pierce Co., $6,596,638.30; Ryan Parker Construction Co., $6,493,223; General Erecting Co., $6,769,191.65; Milliken Bros. Inc., $7,566,191.65. The award will be made when the estimates have been tabulated and the securities offered have been passed upon.

The American Bridge Co. during April secured orders representing 61,000 tons of steel; the total of last week is more than 8,000 tons. Among recent bookings are the following: Carnegie Steel Co., addition to one of the mills, 500 tons; three buildings in and around Pittsburg, 7,500 tons; Santa Fe R. R., 700 tons; addition to Savoy Hotel, New York, 600 tons; Long Island R. R., about 625 tons; Atlantic Coast Line, 560 tons; Northern Pacific R. R., 3,000 tons; and a large number of small orders making in the aggregate a considerable tonnage.

Milliken Bros. Inc. has been awarded a contract for the erection of a new plant of the Proctor & Gamble Co., of Cincinnati, to be located on Staten Island, near the Milliken plant. The steel required for the building, some 2,500 tons, has not yet been placed.

CORNER STONE OF ENGINEERING BUILDING LAID.

The corner stone of the United Engineering Bldg., in New York city, which is to house the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the American Institute of Mining Engineers and other societies of similar character, was laid on Tuesday, May 8, by Mrs. Andrew Carnegie.

Brief addresses were made by E. E. Olcott, T. C. Martin and Andrew Carnegie. Mr. Carnegie spoke of the value of the ability of American engineers to get together, and stated that union in science was as necessary as union in politics. He compared Uncle John Fritz to Uncle Joe Cannon. The presence of Mr. Charles Haswell, ninety-seven years old, and probably the oldest living engineer in active practice reminded him of Kipling's story of the devout old Scotch ship engineer who, after seven days of severe storm gave thanks thus:—"Oh Lord, thine be the praise, but ye ken ye need an engineer." Mr. Carnegie concluded by hoping that the engineers would soon finish and occupy the building and invite him to the first dinner.

Among those present were Charles Haswell, John Fritz, R. W. Raymond, C. W. Hunt, F. W. Taylor, J. M. Dodge and other notable engineers.

Metal Market

NEW YORK.

May 7.

Pig Tin.—The market has experienced another phenomenal rise. There is a scramble among American consumers and no one can predict the limit of the soaring. The following are today's quotations: Spot, 42½ to 43; May, 42 to 43; June, 41½ to 42½; London, £193 and £189 10s; arrivals for the month to date, 425 tons; afloat, 1,662 tons.

Copper.—The market has been dull but prices have held firm. Consumers appear to be well covered. Today's quotations follow: Lake, 18½ to 18¾; electrolytic, 18¼ to 18½; casting, 18 to 18¼; London's closing today: £83 and £82. Exports for the month to date, 1,605.

Lead.—Refined lead has been strong with the demand very active and stock difficult to secure. Today's closings, 5.75; St. Louis, 5.65; London, £16 10s.

Spelter.—Reimportations of metal have had an unfavorable effect. Today's closings, 6 to 6.10; St. Louis, 5.95; London, £26 7s 6d.

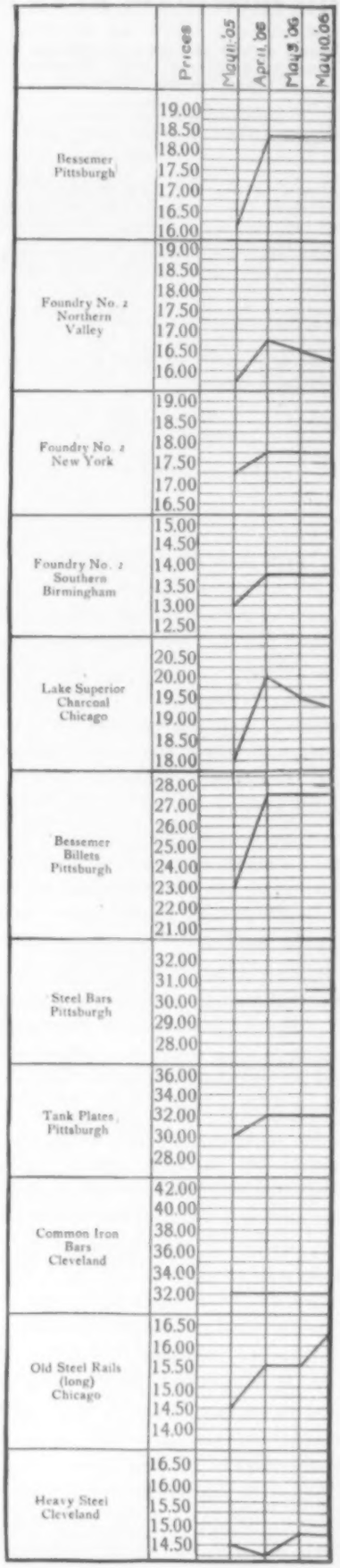
Antimony.—The market has been excited and prices are again higher. Today's quotations, Cookson's and Hallett's 24 to 25; other grades, 23½ to 24½.

ST. LOUIS.

St. Louis, May 7.

It is believed that price reductions in zinc have been brought to a standstill. The heavy shipments from the Joplin field are accepted as a token that the decline, which has been going on for three months, amounting to $10 a ton, has been stopped. Strange to say, the drop came simultaneously with the announcement that zinc carbonates from Mexico would be assessed an impost duty of 20 per cent ad valorem. These continued price reductions have curtailed the value of the field's product more than a third of a million dollars. Lead is scarce and in demand. It is nominally higher, $5.70 being refused for Missouri brands. Spelter is dull and drooping; lower to sell, being offered at $5.92½ and unsold.

PRICE CHART.



THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.

PUBLISHED EVERY THURSDAY BY
THE PENTON PUBLISHING CO.
CLEVELAND

CHICAGO - - 1164 Monadnock Block
PITTSBURG - - - 521 Park Building
NEW YORK - - - 150 Nassau St.

Subscription, $3.00 per annum. To Foreign Countries, $4.50. Advertising Rates Furnished on Application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co., will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

ENTERED AT THE POST OFFICE AT CLEVELAND, AS SECOND CLASS MATTER

PRINTED IN AN OPEN SHOP

May 10, 1906

THE A. S. M. E. MEETING.

The fifty-third meeting of the American Society of Mechanical Engineers, held in Chattanooga, Tenn., last week, is worthy of mention in several respects. Although the registered attendance was smaller than in many years, the higher than usual percentage of members registered, made the actual number present of those interested in the real work of the society fairly comparable with other meetings. That those who made the long trip to Chattanooga feel amply repaid there can be no doubt. Coupled with the natural charm of one of the most beautiful sections of the country, were the historic associations of the region, and he is a poor American, indeed, who has not a stronger regard for his country as a result of the trip.

An unusually efficient local committee, left nothing undone which could contribute to the enjoyment of the meeting. The fact that but two of the members of the society were residents of the vicinity, and were aided on the local committee by brother engineers in other branches of the profession and members of other societies, is noteworthy. The society expressed its appreciation of the work of these men in a resolution of thanks at the close of the meeting.

But it is not of the social and excursion features of the convention that we wish to speak particularly. The unusual value of the papers presented, the reading and discussion of which are the real object of these meetings, deserves special attention. That on the collapsing pressure of Bessemer steel lap-welded tubes, by Prof. R. T. Stewart, records the results of one of the most carefully conducted, and extensive series of tests ever made. The mere fact that the work of making these experiments extended over four years and required the services of from one to six men indicates the scope of the investigation. The results obtained add much to the store of engineering knowledge, making clear points which were before in doubt, and bringing out facts which were absolutely unknown. This paper is an invaluable accession to engineering literature.

Prof. W. H. Bristol's paper on his thermo-electric pyrometer gives to us an instrument which is bound to find the widest application. The subject of pyrometry has been one of the most vexing in engineering.

The existing types are all expensive, and require the services of a highly skilled operator, with ability to make corrections for various errors, and competent to handle the most sensitive type of apparatus. The submission of such an instrument to the hands of an ordinary laborer could not, for a moment, be considered. But for proper working of furnaces, annealing ovens, and the thousand other things in which an accurate knowledge of temperature is desirable, if not necessary, the measuring instrument must be constantly used by the workmen themselves. Prof. Bristol seems to have perfected an instrument which will stand a fair amount of rough usage, is comparatively inexpensive, and which may therefore safely be intrusted to the man on the job. That engineers have been looking long for such a pyrometer was demonstrated by the interest excited at the convention, and the numerous uses for it which were suggested, but which Prof. Bristol had not considered.

Another apparatus of much potential value was described by Geo. B. Willcox in his paper entitled "New Liquid Measuring Apparatus." Its application to boiler tests will be readily seen and many other uses for it will undoubtedly be discovered.

The papers on other subjects which were presented were all of high character, and should be carefully read. The committee on papers deserves great credit for its wise selections. It is work of this class that has made the American Society of Mechanical Engineers one of the leading scientific bodies of the world. With the opportunities before it, and the excellent facilities it will have in its new quarters in New York, it should rise to a higher plane than ever.

HEAVIER RAIL SECTIONS IN VOGUE.

It is well known that there is a general tendency towards the employment of heavier rails, in order to support the heavier loads now carried on the standard railroads, as well as to increase the life of the rail and avoid the expense of frequent renewal. As there must be the proper balance between head and flange, in the rolling operation, the addition of more metal to the head involves a still greater addition to the total amount of metal in the rail.

Since 1897 the statistics of the American Iron & Steel Association have separated the rails rolled into three classes as to weight: those weighing less than 45 pounds per yard, those weighing 45 pounds or more but less than 85 pounds, and those weighing 85 pounds or more per yard. These statistics show very clearly the trend towards heavier rails. Rails under 45 pounds per yard may be disregarded entirely; they do not go onto the standard railroads of the country, except in rare cases, but are used in small industrial operations. The bulk of the tonnage of rails 45 pounds and heavier and under 85 pounds is comprised of 65 to 75-pound sections. The heavier class is composed mainly of 85-pound rails, with some 90-pound and an important though not very large tonnage of 100-pound rails. The production of these two classes of weights in 1897 and since is shown in the table below, which gives also the percentage which the rails of 85 pounds and heavier constituted of the two. It may be mentioned, incidentally, that the tonnage of rails under 45 pounds increased quite steadily from 88,896 tons

in 1897 to 291,883 tons in 1904, and then fell back to 226,580 tons in 1905. Possibly this decline was due to the higher price of light rails in 1905. Standard rails have been at the same price since the spring of 1901, and now include rails 50 pounds and heavier, whereas the rail mills formerly included rails 45 pounds and heavier in the standard price.

Production of Rails 45 Pounds per Yard and Heavier, gross tons:

Year.	Over 45 pounds but under 85 pounds.	85 pounds and over.	Total 45 pounds and over.	Percentage of 85 pounds and over.
1897	1,223,435	335,561	1,558,996	21.5
1898	1,404,150	453,210	1,857,360	24.4
1899	1,559,340	579,524	2,138,864	27.1
1900	1,626,093	602,058	2,228,151	27.0
1901	2,225,411	493,822	2,719,233	18.2
1902	2,040,884	645,162	2,686,046	24.0
1903	1,603,088	1,168,127	2,771,215	42.1
1904	1,320,677	672,151	1,992,828	33.7
1905	1,599,624	1,546,053	3,145,677	49.1

Here we have a steady increase in the proportion of the heavier sections, barring two setbacks. That in 1900 and 1901 is unimportant. That in 1904 is easily explained. In 1902 and 1903 the total tonnage of rails was about the same, but in 1902 the proportion of heavy rails was 24.0 per cent and in 1903 it was 42.1 per cent. In 1902 there was much building of new roads and of trolley roads, which in general take rails less than 85 pounds. In 1903, on the other hand, the orders were much more strictly confined to replacement orders by the large roads, and heavy sections were taken. This put the proportion very high. Then, for the season of 1904, the large roads were hoping for a reduction in price, and placed orders as small as possible, which put the proportion down again. For 1905 there were no special conditions and the percentage shown for that year was the normal, representing a marked increase in the nine years covered by the table. It can be said on authority that the statistics for the present year will show a further increase in heavy sections, so that rails 85 pounds and heavier will constitute much over 50 per cent of the total of all rails 45 pounds and heavier.

There has not been noticed, in the past three or four years, any greater tendency towards the 100-pound rail. Most of the roads still prefer an 85 or 90-pound rail. Instead of going in for still heavier rails, the railroads are more likely to call for better material. The desire for open-hearth rails has much increased, and nickel and other alloy steel may find much vogue.

Much of the replacement work now going on is to replace, with 85-pound and heavier sections, rails which are not worn out, but are too light. When the bulk of the track has been relaid with heavy rails there may be a tendency to a halt in the increase in tonnage, but the total track to be kept up is increasing each year, and the duty is increasing through heavier loads, greater speeds and greater density of traffic. Indeed, the swing at the moment is clearly towards greater and greater production. The orders booked for this year's delivery of standard sections are now well over 3,000,000 tons, and this, with orders still to come, and the tonnage in light rails, promises a total a quarter million tons or so in excess of last year's total, while the rate at which the mills are working indicates that the tonnage can actually be made, and the early opening of order books for 1907, with the comfortable tonnage already entered, is some presage of a still heavier tonnage next year.

Among the numerous editorials published by daily newspapers on the proposition to remove the tariff from iron and steel products to be used in the rebuilding of San Francisco are many statements that would be startling if they were not so ridiculous. For example, the *Chicago Chronicle* expresses fear of what it is pleased to term "a calamity advance in prices." As a matter of fact, an advance of prices has not been thought of, and there is not the slightest danger that there will be any advance on account of the comparatively small demand from the stricken city. Information obtained since our editorial of last week was published convinces us that we were too low in our estimate of the production of structural shapes for 1906. It now seems certain that the output for 1905, for which official figures will soon be available, will amount to 1,650,000 tons, and that if present prosperous conditions continue, the output for 1906 will be about 2,000,000. With such a large production the demand from San Francisco will not have any important effect.

ALL DEMANDS

For Steel for 'Frisco Can be Easily Met.—Judge Gary Predicts Lake Strike will Soon be Ended.

(Special Correspondence.)

New York, May 7.—The U. S. Steel Corporation will be ready to meet any extraordinary demand for structural steel that may arise in the rebuilding of San Francisco, and that without interfering in the least with the rights of present patrons. Judge E. H. Gary, in an interview with a representative of THE IRON TRADE REVIEW, said that the extra demand would be taken care of entirely by increased production. Besides, it is extremely doubtful whether a supply could be secured as quickly abroad as in this country, for practically all of the European mills are booked through the year.

Concerning the strike of the longshoremen on the lakes, Judge Gary said: "I apprehend no great difficulty in that direction. Let me see—THE IRON TRADE REVIEW appears on Thursday, does it not? I think I can safely predict that all will be serene by that time. In all probability the strike will be settled before Thursday."

Although the officers of the U. S. Steel Corporation anticipate a considerable demand for structural material from "The City that Was"—and will be rebuilt more beautiful than ever—the chairman of the board of directors does not believe that the orders from that source can seriously embarass the producing mills. A rough estimate shows that even if the business of reconstruction were pushed to the utmost, San Francisco could not use more than one twentieth of the output of the corporation's plants. That would be spread over a period of four or five years.

Within the past two weeks the new structural plant at South Chicago has been placed in operation with a monthly capacity of 15,000 tons of structural shapes. While a considerable amount of this tonnage may be pledged for other demands, still, Judge Gary says, a very large proportion could readily be used for the requirements of San Francisco. The improvements at the Lorain plant, which have been going on quietly for a long time and on which the corporation has during the past two years expended between $10,000,000 and $11,000,000, have, he says, increased the capacity of that plant to such a degree that any demand directly due to the disaster on the Pacific coast could be met by the increased output supplemented by the extra production available at South Chicago.

STRIKES IN MANY FOUNDRIES

INVOLVING FROM SEVEN TO EIGHT THOUSAND EMPLOYES

Special Convention of the National Founders' Association will be held in Chicago Saturday. Will consider advisability of making contracts with Union.

Strikes involving the foundries of numerous cities and between 7,000 and 8,000 employes have been declared. While questions of wages and hours are to be settled, the members of the National Founders' Association say that the real matter of difference is as to whether contracts shall be made with the union. There has been some difference of opinion on this subject in the N. F. A. and it will be fully considered at a national convention of all the members of the association, which has been called to meet in Chicago on Saturday, May 12. This action was decided upon at a meeting held in Detroit, Saturday, May 5, of members of the National Founders' Association representing shops that had been struck by the molders in Boston, Buffalo, Pittsburg, Cleveland, St. Louis, Kansas City, Minneapolis, St. Paul, Milwaukee and Chicago. According to a statement issued by officers of the organization at the close of the meeting, the total number of molders out in all parts of the country is between 7,000 and 8,000. After a full discussion, a unanimous vote was cast declaring absolutely against signing any agreement with the national or local molders' unions, and proclaiming firmly for the open shop.

In Chicago, twenty-two concerns, employing about 800 molders are resisting the demands of the union. Since the commencement of the strike, a number of members of the N. F. A., as well as of the Cook County Founders' association have given up the battle, however, being forced to do so by similar action of their competitors. Among those who are operating under a closed shop agreement are the Ferguson & Lange Foundry Co., R. M. Eddy Foundry Co., Tarrant Foundry Co., Barnum, Richardson & Co., and the Brady Foundry Co. The Chicago plants that are successfully operating on the open shop principle include those of the H. W. Caldwell & Son Co., Link Belt Machinery Co., Aermotor Co., International Harvester Co., and all the malleable foundries. The Western Electric Co. has not yet announced its decision.

Demands of the Molders.

A circular issued by the National Founders' Association says:

"We desire to inform you that demands have been made for increased wages, for shorter hours, or both, and universally coupled with a demand for closed shop signed agreements, in shops employing molders and coremakers, to the number of at least 20,000 during the past ten days. These demands are very generally being resisted, and as a result some 7,000 molders are today on the street. Never before in the history of the foundry business have such radical steps been taken by the union."

While the union demands vary in different localities, the general object of the strike is a shorter day with wages remaining the same or slightly advanced. The amount in controversy averages between 5 and 10 per cent, and in several instances the situation is complicated by other features.

In Buffalo, Tonawanda, Depew and Lancaster practically all union molders are out for an advance in wages, the demand being for a $3.00 minimum wage.

In Scranton a nine-hour day with present wages is sought.

In Boston 350 molders are out for a $3.00 minimum wage.

In Milwaukee and Beloit the demand is for a wage advance. The same is sought in St. Paul and Minneapolis, and the majority are out in all these places.

In Toledo about one-half the union molders are out, while one-half have agreed to a wage scale of $2.75 for coremakers and $3.00 for molders.

In Kansas City the demand is for the $3.00 minimum with a nine-hour day. Some few firms have settled, but about 100 men are out. The core makers' demands are similar.

St. Louis is not directly affected, but about 700 skilled workmen are out at Belleville, Ill., their demand being for the shortening of the day to nine hours and an increase in wages. Iron houses have been requested to hold up shipments.

In Jersey City, New York and Brooklyn, Newport, Covington and Cincinnati the situation is covered by the annual agreements entered into some time ago before the present trouble developed. About 2,800 men are affected in the two districts. In the anthracite district many foundries signed the agreement, and this course has been generally followed by employes in the smaller cities.

Longshoremen Weakening.

The strike of the longshoremen, which has been in effect since May 1, is apparently nearing a close. No attempt has been made on the part of dock or shipping interests to bring about an end of the strike through drastic measures. The belief has been entertained from the start that it will end itself without interference from outside and this theory has been borne out by the developments of the last few days, which have shown a growing spirit of dissatisfaction among the striking dock laborers. This is but natural when it is considered that less than one-tenth of the mates, in whose supposed behalf the strike was declared, have left their vessels. Almost to a man they have remained at their posts and the places of the few deserters have been readily filled. The longshoremen generally answered the call of President Keefe and union-manned docks along the lakes have been idle since May 1, but signs of revolt at the strike order have grown stronger day by day and every indication now is that the bottom will drop out of the strike within a week or ten days.

Meanwhile, furnaces are operating without difficulty and will not be embarrassed to any extent before June 1 and in many cases a month later. Non-union docks at Buffalo, Detroit, Milwaukee, Chicago and other points, more than a dozen in all, have operated steadily. Their combined capacity is large, as last year they handled in the neighborhood of 10,000,000 tons, about thirty per cent of the entire tonnage handled on the lakes. This is aiding the situation materially. Vessels anchored along the lower lakes carry about 1,000,000 tons of ore. It will require about a week to unload them when the end comes.

Structural Iron Strike.

The strike of the structural iron workers continues without change, the Pittsburg and Chicago districts being chiefly affected. Among the members of the union, however, sentiment is growing in favor of referring the questions at issue to arbitration in accordance with the proposition which was made by the employers before hostilities commenced, but was flatly rejected by the union at that time. The scale of the iron workers for the past year, which is still being paid in New York, is 56¼c an hour, or $4.50 a day of eight hours, the demands

of the union being an advance of 50 cents a day, or to 62½ cents an hour. All the leading fabricating plants of Chicago are involved in the struggle, including Vierling, McDowell & Co.; Dearborn Foundry Co.; South Halstead Street Iron Works; Hansell-Elcock Co.; Butler Street Foundry & Iron Co.; A. Bolter's Sons; Holmes, Pyott & Co.; Winslow Brothers Co.; Chicago Ornamental Iron Works, and the F. P. Smith Wire & Iron Works. It is understood that the National Erectors of Iron and Steel Association, of New York, is cooperating with the Chicago Iron League in the present struggle.

Anthracite Strike Ends.

After six weeks of idleness, the anthracite mining district is to resume operations within the course of a few days. The end of the strike came just in time to bring relief to a number of furnaces which employ anthracite fuel: several had been compelled to bank and others were on the verge of closing down when the settlement came. Under the terms of the agreement the award of the strike commission of three years ago is to continue in force for three years more. This is a victory for the operators.

GENERAL ELECTRIC CO.'S ANNUAL REPORT.

The fourteenth annual report of the General Electric Co. has been made public. It shows a most satisfactory condition of business for the fiscal year ending Jan. 31, 1906. Profits of the company were $7,319,160.61, dividends paid were $3,861,062, leaving net profits for the year $3,458,098.61. A sum of $1,000,000 was set aside for the company's patent accounts, leaving a surplus of $2,458,098.61, which, added to the surplus of the previous fiscal year, made the total Jan. 1, 1906, $12,027,295.09. The sales billed by the company during the year were about $4,000,000 in excess of those of the previous year, showing an increase in business of about 10 per cent. The total sales aggregated $43,146,902, and total orders received $50,044,272.

The report deals in detail with the subject of heavy traction motors, Sprague-General Electric crane control, Curtis steam turbines, for which many foreign orders have been received; single-face A-C railways, which have been placed on a number of important lines, and the order for 25 100-ton locomotives for operation on the New York Central terminal. The first of these, which has been in operation for some time for testing purposes, has shown, it is stated, that its cost of maintenance averaged only about one-fourth that of a steam locomotive.

LINK BELT INTERESTS TO UNITE.

Chicago, May 8.—What will undoubtedly result in the largest organization in America for the manufacture of hoisting and conveying machinery is the proposed merger of the Link Belt Machinery Co., of Chicago, the Link Belt Engineering Co., of Philadelphia, and the Ewart Mfg. Co., of Indianapolis, Ind. Preliminary steps have already been taken to combine these interests under one management, and the consolidation will doubtless be effected at a meeting to be held about June 1. The three firms have been practically under the same ownership since their organization, the Philadelphia company being the outgrowth of the eastern office of the Chicago firm, which is the parent company. The consolidation is undertaken simply for the purpose of economy in management, neither of the firms being in any sense competitors. No details as to the capital stock or proposed officers of the new company can be learned, but as possibly bearing on the former, it is noted that the Chicago firm recently took legal steps towards increasing its capital stock from $650,000 to $3,500,000. The officers of the Chicago company are: E. A. Turner, president; Staunton B. Peck, vice president, and Dyke Williams, secretary and treasurer. James M. Dodge is president of the Philadelphia firm.

Of interest in this connection also are the rumors that negotiations have been in progress for some time between the Jeffrey Mfg. Co., Columbus, O., and the Goodman Mfg. Co., of Chicago, with a view to consolidating their respective interests.

BIG COKING COAL DEAL.

A tract of about 1,600 acres of coking coal in Fayette county, Pa., was sold during the week by J. V. Thompson to the Thompson Connellsville Coke Co., which will proceed at once to develop the property. The coal lies in the Dunlaps Creek basin and adjoins some of the most extensive coke fields in the district. It is understood that it sold for $1,400 an acre. The Thompson Connellsville Coke Co. was recently organized by Chas. Donnelly, F. H. Richard and W. G. Rock of Pittsburg, and A. A. Thompson and Lloyd G. McCrum of Uniontown. Mr. Donnelly, formerly president of the McClure Coke Co., is president of the new concern which has issued bonds to the amount of $3,000,000. Sites have been chosen for the location of two 400-oven coke plants which will be connected with the Monongahela railroad.

WILL INSTALL GAS-DRIVEN BLOWING ENGINES.

The Carnegie Steel Co. has decided to inaugurate at its Edgar Thomson and Homestead plants one of the greatest economical departures in the history of the iron and steel business by installing as soon as possible six gas-driven blowing engines and two gas-engine electric units to be operated by the surplus gas generated by the blast furnaces at these plants.

Announcement was made in THE IRON TRADE REVIEW last week of a contract by the Carnegie Steel Co., with the Allis-Chalmers Co., of Milwaukee, for the construction of four-gas-driven blowing engines of 3,000 horsepower each and one gas engine electric generator. The company has also contracted with the Westinghouse interests for the construction of two gas-driven blowing engines of 2,000 horsepower each and one gas engine electric generator. The Allis-Chalmers engines will be installed at Homestead and the Westinghouse engines will be installed at the Edgar Thomson plant. The Allis-Chalmers generator at Homestead will be 2,000 kilowatt and the Westinghouse at Edgar Thomson will be a 1,500-kilowatt generator.

In connection with the installation of these blowing engines, which will be operated by blast furnace gas, some interesting figures have been obtained through the operation of a test engine of the same pattern which has been in successful operation at the Edgar Thomson plant for the past six weeks.

To operate the new blowing engines and generators it is estimated it will require 120 cubic feet of gas per horsepower per hour. It is also estimated that a modern 600-ton blast furnace generates 61,000 cubic feet per minute. At the Edgar Thomson plant, where there are eleven blast furnaces, the two new engines will develop 2,000 horsepower each, thus requiring 4,000 cubic feet each or 8,000 cubic feet altogether per minute while the engine operating the generator will require an additional 4,000 cubic feet, a total of 12,000 cubic feet or one-fifth the producing capacity of one furnace to operate the three engines.

These installations will dispense entirely with the immense boiler plants necessary to supply steam to the old type steam blowing engines and the fuel to operate the new engines will cost nothing save the initial cost and maintenance charge of a gas washing apparatus.

Directors of the Tennessee Coal, Iron & Railroad Co. meet in New York May 15.

HARD KNOCKS HELP.

MR. GAYLEY PREACHES THE GOSPEL OF ENTHUSIASM.

Rejoices That There Are Fools To Rush in Where Angelic Conservatism Fears to Tread.—An Address to Students.

"Wear a smile—it will help you get a job."

"Enter upon your work with enthusiasm—therein lies greatness."

"Remember that a sunny disposition is the only umbrella in this vale of tears."

These were sentiments expressed by James Gayley, first vice president of the United States Steel Corporation, in his address to the graduating class of the Michigan College of Mines, Houghton, Mich., at the class day exercises held last Friday evening at the Kerredge theater, Hancock.

Mr. Gayley, in his opening remarks, compared the meager opportunities for a thorough special training as a mining engineer in the days of his college career with the opportunities afforded today in such an institution as the Michigan College of Mines, a particular advantage in the latter case lying in the atmosphere of mining with which the college is surrounded in its location in the center of the lake copper belt. However, a man must not expect to become an expert merely by his college training. That portion of his work rather provides him only with a tool, through the instrumentality of which he must shape his further progress.

The speaker said that genius is the ability to express work efficiently. A young engineer need not worry about the line of engineering he had best choose, for in time, if he exercises the highest ability that is within him, the call for the line to which he is best adapted will come with such force that he can not do otherwise than respond. And, he declared, the world is full of golden opportunities, incidentally pointing out in this connection that the man who does more than is expected of him and who gathers bits of information about the work which lies out of his own narrow pathway will be noticed by those who are in command of the greatest opportunities. The chemist who makes analyses all day and retires to his bed to dream of precipitates all night will never make a manager, he said. He pointed out the more successful way: Let the chemist spend his evening and his spare moments around the works, absorbing the knowledge that is necessary to conduct other lines of the institution with which he is associated. Then his opportunities will broaden. "The man who does only the work for which he is paid only gets paid for the work which he does," the speaker asserted.

Mr. Gayley said that the opportunities are just as great today as they ever were in history, if not greater. It is only the one who shrinks from the ore paint of the mine, from the grease and grime of machinery or from the smoke of the furnaces that misses the great things which line the pathway of the engineer. Having found the opportunity, the speaker pointed out, the rising engineer will find difficulties coming hard and fast. But it is meeting and overcoming difficulties that make men great. Such achievement is not by long flights, but step by step until success crowns the effort. He quoted Bill Nye's description of Wagner's music, "For one who understands it, it is not half so bad as it sounds," to emphasize the point that difficulties are not half as bad as they seem.

Accuracy in details is a prime essential, Mr. Gayley said. Engineering is an exacting profession and there is little of forgiveness in it. He pointed out that an error at a vital moment might be the undoing of the greatest opportunity, because there can be but one greatest opportunity and that may be the one in hand. Concentration was another essential for the engineer to cultivate. Just as concentration is performed in minerals, so it must be practiced in the mind of the engineer. The vein may be wide and it may be deep, and to recover its values and turn them to the uses of man the ore must be concentrated and the dross eliminated. He held as almost the best advice ever given him the orders of an early employer that he should sit down one hour daily in the midst of a busy life and concentrate his mind upon the mental contemplation of the work in his charge.

Expression with the engineer is by three main channels, said the speaker. It may be by reports, by estimates and by spoken words. Then he pointed out the need of a thorough training in the English language. Reports are written to be read, he said, and therefore the proper use of language is essential, so that the idea may be as clearly conveyed to the reader as it exists in the mind of the writer. Instill in a man a love for the best in literature and give him touch with the great minds of the world, and he will have no time left for sordid companionship, said the speaker.

Integrity was dealt upon as the crowning attribute, which should be held sacred above all else that the engineer represents. He said that many engineers' reports dwell not upon statements of conditions but upon speculation of possibilities, representing, in the words of Mark Twain, "The greatest return of conjecture for the least expenditure of facts." "Be truthful," he said, "no matter what your employer may demand of you. It is true that you may lose one employer by such a policy, but you will find many employers waiting for your services because of that virtue, and when you have sped the last arrow from your bow and it falls from your failing grasp, the world can utter no word of shame to your memory."

Mr. Gayley took up the discussion of mistakes. He said that men who are not making mistakes are not doing anything in the world and a man who is not active enough to make mistakes should make the greatest mistake of his life and retire to a monastery. "Mistakes are the result of personal effort," he said, "and the man who never takes a chance will never recognize a good thing when it comes his way. If there were no fools to rush in, the world would be at a standstill, but thank God we have fools to rush in where angelic conservatism fears to tread. The late Marcus Daly could excuse a man who made a mistake, but said he had no regard for the man who let a thing get away from him for want of trying.

In his final words Mr. Gayley said that those who attacked the acquisition of wealth were enjoying in life the very advantages that exist by virtue of the wealth which they assail. He said that the Middle Ages were the great wealth-acquiring period; this wealth brought leisure, leisure brought opportunity for mental repose and thought, thought brought about the Italian renaissance and it also brought the learning and taste for literature, which had as its fruitage the translation of the Bible, the enlightenment of the masses, the reformation and the rich learning which has followed. Then following this freedom from mental slavery, came the impulses which demanded freedom from feudal vassalage, culminating in the French revolution and the beginning of democratic governments. Why may not the world today, he queried, be living in an age that is a duplication of those times, and thus awaken to a higher and grander understanding of the Fatherhood of God and the brotherhood of man than the world has ever known? A new revolution by which the rights of man will be established on a grander scale will result.

PENNSYLVANIA STEEL CO.

Annual Report of President Felton Shows Heavy Earnings.

The annual report of President E. C. Felton of the Pennsylvania Steel Co. (of New Jersey) has been sent out to the stockholders. It shows the income account for the year ending Dec. 31, 1905, as follows:

Net earnings	$4,986,248.24
Rentals, interest, etc	277,717.18
Gross income	5,263,965.42
Int. on bonded debt	811,562.56
Net income	4,452,402.86
Gen. and spec. depreciation charges	1,755,191.72
Net profits of subsidiary companies	2,697,211.14
Dividends paid	1,164,000.00
To reserve fund for plant improvements	1,533,211.14

The report is the most satisfactory in the history of the company, the item of net earnings comparing with $2,572,476 in 1904, $3,380,434 in 1903 and $3,690,864 in 1902. The surplus was also larger than in any previous year, though depreciation charges were extremely heavy. The balance sheet of the company May 1, 1906, follows:

ASSETS.

Cash	$507,802.30
Loans to Op. Cos.	1,000,021.87
Stocks and Bonds	26,129,680.26
Accrued Interest	9,490.67
Total assets	$27,646,995.10

LIABILITIES.

Capital stock, pref.	$16,500,000.00
Capital stock, com.	10,750,000.00
Loans from Op. Cos.	221,804.00
Profit and loss	175,191.10
Total liabilities	$27,646,995.10

Concerning the mining properties of the company, President Felton says: "The Spanish-American Iron Co., whose mines are located near Santiago in the island of Cuba, mined during 1905, 422,000 tons of iron ore compared with 342,000 tons in 1904. There would have been a greater increase in the production had it not been for the scarcity of labor in the island of Cuba. A considerable emigration of laborers from Spain has now improved matters and the output of the mines is at a satisfactory rate. The estimated ore reserves at the end of the year were equal to those at the beginning, a very satisfactory condition of affairs.

"The manufacturing properties are the Pennsylvania Steel Co., of Philadelphia, with works at Steelton and Lebanon, Pa., and the Maryland Steel Co., with works at Sparrow's Point, Md. All of these works were operated at a normal rate during the last nine months of the year. 748,000 tons of pig iron were made in 1905, as compared with 615,000 tons in 1904, and 847,000 tons of steel ingots in 1905, as compared with 618,000 tons in 1904.

"The low prices which prevailed during 1904 continued during the early part of 1905, so that the manufacturing companies had the advantage of the present prices only during the last two-thirds of the year.

"At the Steelton plant of the Pennsylvania Steel Co., the construction of one hundred and twenty by-product coke ovens has been begun. The completion of these ovens will make all the plants of the manufacturing companies independent, so far as their supplies of coke for blast furnace purposes are concerned.

"The funds required for the erection of these coke ovens have been provided by an issue of $1,250,000 four and one-half per cent bonds, secured by a mortgage on the coke oven plant. These bonds mature one-tenth each year for ten years and are payable at any time at the company's option at 102½.

"At the Steelton plant, improvements were also made during the year by the addition of new hot stoves and boilers to the blast furnaces.

"At the Lebanon plant, further expenditures have been made on the ore concentrating plant which will be completed about July 1.

"At the works of the Maryland Steel Co., a large expenditure was made for improving the blast furnaces. A complete remodeling of the engine and steam plant of the entire works is now under way.

"The marine and dock departments completed the floating steel dry dock Dewey for the United States naval station in the Philippine islands, which has been under construction for more than a year. In June last, after exhaustive and satisfactory tests, this great dock, the largest of its kind in the world, was delivered to the United States government at the testing ground in Chesapeake bay. It is now being towed by the navy department to its station near Manila. There were also completed during the year, by the marine department, two sea-going dredges for the United States government, four ferry boats for the city of New York, a sea-going tug and two car floats.

"Considerable improvements are in contemplation at the works of all the manufacturing companies. These improvements include, for the works of the Pennsylvania Steel Co. at Steelton, the construction of a new open-hearth plant which the increasing demand for this kind of steel makes necessary, and for the Maryland works, the equipment of its ore docks and blast furnace plant with the most modern and economical devices for handling raw materials.

"The large consumption of coking coal by the manufacturing companies, in their coke oven plants, has rendered advisable the control and operation of coal mines in the interest of your company. To meet this requirement, the Penn-Mary Coal Co. has been organized, all of the capital stock of which is owned by your company, and this coal company has acquired a tract of about 16,000 acres of coal lands in Indiana county, Pennsylvania, which will be developed during the current year. The major part of the funds required for the purchase of these coal lands has been provided by an issue, by the coal company, of time notes, payable in six months, one year, eighteen months and two years, amounting to $1,750,000. The coal lands thus acquired will make your manufacturing companies independent and secure for many years as far as supplies of fuel are concerned."

CAR WHEEL MOLDING

Witnessed by Members of the Pittsburg Foundrymen's Association.

The May meeting of the Pittsburg Foundrymen's Association on Monday evening of the present week took the form of a course of instruction and inspection in car wheel molding when the members of the association to the number of forty, as guests of W. C. Connelly of the Pennsylvania Car Wheel Co., visited the plant of that company in Allegheny and spent a profitable as well as an enjoyable evening.

Under the guidance of Mr. Connelly the foundrymen witnessed the operation of the Pennsylvania Car Wheel Co.'s machine for molding car wheels, the only machine of its kind in the country, and having a capacity of 570 finished wheels per day. It is operated almost entirely by unskilled labor and as a labor saving device is considered one of the most economical in the foundry business. After the visit to the car wheel works a delightful Dutch lunch was served. Secretary F. H. Zimmers, of the association, urged upon the members the importance of Pittsburg turning out a full attendance at the annual convention of the American Foundrymen's convention in Cleveland, June 4—7. The Pittsburgers contemplate engaging a special car and attending the convention about 75 strong. Members of the National Foundrymen's Association were also impressed with the importance of attending the meeting in Chicago next Saturday.

To celebrate the semi-centennial of the opening of its first railway, Argentine Republic is to hold a railway exhibition at Buenos Ayres August, 1907.

WILL BE CONSOLIDATED.

The taking-over of the Power & Mining Machinery Co., Cudahy, Wis., by the International Steam Pump Co. was practically assured when stockholders of the latter company on Monday voted in favor of increasing its capital stock by $8,000,000.

The Power & Mining Machinery Co. was incorporated under New Jersey laws three years ago as successor to the Holthoff Machinery Co. and has since acquired the Loomis-Pettibone Gas Machinery Co. Its plant covers an extensive site at Cudahy, a suburb of Milwaukee, and its product includes gas-generating machinery, gas engines, and mining, smelting and milling machinery. The outstanding capital of the company is $1,000,000 of 8 per cent preferred and $1,500,000 of common stock. Benjamin Guggenheim, its president, is also a director of the International Steam Pump Co. As a condition of the sale, he guarantees that the net profits of the Cudahy company for the next five years will aggregate at least $1,150,000. During this time he agrees to act as chairman of the finance committee and executive committee of the acquiring company without compensation.

The International Steam Pump Co. was incorporated in New Jersey in 1899 and secured control of plants making about 90 per cent of the steam pumps manufactured in this country. A factory costing about $1,000,000 was erected at Harrison, N. J., in 1904. The recently authorized increase in stock, $2,500,000 preferred and $5,500,000 common, brings the total outstanding capitalization up to $29,112,500, of which $17,762,500 will be preferred and $11,350,000 common. The former is 6 per cent cumulative; on the common nothing has been paid since April, 1905. Of the preferred stock a sufficient amount has been set aside to retire $2,000,000 cumulative preference stock of the Henry R. Worthington Co., and a like amount of the Blake & Knowles Co. securities.

The American Pig Iron Storage Warrant Co. reports stocks as considerably decreased during April. March 31, the tonnage on hand was 30,500, receipts for the month were 600 tons, deliveries were 6,600 tons, and the balance on hand April 30 was 24,500 tons.

The ninth annual meeting of the American Society for Testing Materials will be held at Atlantic City, N. J., begining June 21. The congress of the International Society will convene at Brussels, Belgium, Sept. 3 and will continue five days.

PERSONALS.

Frank H. Buhl, Sharon, Pa., has returned from Europe.

F. S. Blanchard has been made manager of the Ashcroft Mfg. Co., Bridgeport, Mass. He is a graduate of Massachusetts Institute and has had wide experience.

J. C. Sullivan has been transferred from the New York branch of the Carpenter Steel Co., to Reading, Pa., where he will act as general sales agent for that division.

C. Randolph Smith, superintendent engineer for Armstrong, Whitworth & Co.'s shipyard, has been made manager of the engineering department of Barclay, Curle & Co., Glasgow.

William A. Baldwin has retired as president of the Cleveland & Marietta Railway Co., after 55 years spent in railroading, of which 43 were with the Pennsylvania and allied lines.

Henrich J. Freyn, engineer of the gas engine department of the Wellman-Seaver-Morgan Co., Cleveland, has resigned and will accept a position with the Illinois Steel Co., South Chicago.

David J. Jenkins, general electrician of the Pennsylvania Steel Co., has resigned to engage in a similar occupation at Syracuse, N. Y. He had been at the Steelton works for several years.

Thomas L. Bryce, for four years superintendent of the Aetna Foundry & Machine Co., Springfield, Ill., has been made superintendent of the Litchfield Foundry & Machine Co., Litchfield, Ill.

James C. Black, for 20 years with the Rodney Hunt Machine Co., Orange, Mass., has been secured to take charge of the water wheel business of the Humphrey Machine Co., Keene, N. H.

Alvah Smith, superintendent of the Riverside department of the National Tube Co., Wheeling, W. Va., has been made manager of the Northern furnaces of the Republic Iron & Steel Co., Youngstown.

L. H. Thiele, superintendent of the Sylvan mills of the Republic Iron & Steel Co., Moline, Ill., has resigned. J. J. Worker, master mechanic, succeeds him, with M. J. Eggan as assistant superintendent.

Anthony N. Brady has been chosen a director of the Tennessee Coal & Iron Co., succeeding Don H. Bacon, who recently resigned from the presidency. Mr. Bacon, it is understood, will soon start on an extensive foreign trip.

C. M. Mackenzie has been appointed superintendent of the Williams mine at Biwabik, Minn., now being opened by the Thomas Furnace Co., of Milwaukee. He was formerly superintendent of the Pettit mine for the Republic Iron & Steel Co.

A. C. Hezlep, engineer of maintenance of way of the Wabash, and Arthur Hecker, assistant engineer at Canton, O., have resigned and will organize an engineering and contracting firm in Cleveland, to be known as the Central Engineering & Contracting Co.

W. H. Sterling, division superintendent of the Tennessee Coal, Iron & Railroad Co., has been made general manager of coke oven operations for all divisions of the company. J. H. McHugh succeeds him as superintendent of No. 2 division with John F. Meager as assistant.

Horace V. Winchell, chief geologist for the Amalgamated Copper Co., Butte, Mont., has resigned and on June 1 will enter the employ of the Great Northern railroad, with which he was formerly connected as geologist. He was for a time assistant geologist for the state of Minnesota.

Eugene N. Foss, treasurer and general manager of the B. F. Sturtevant Co. and head of the Becker-Brainard Milling Machine Co. and the Mead-Morrison Mfg. Co., is in Europe, partly for rest and partly to make a study of certain economic questions affecting the foreign trade of the United States.

Thomas Smith, formerly foreman at the Upper Works of the Carnegie Steel Co., Youngstown, has been appointed superintendent of the Lower Works, and Harry J. Baugh, son of general superintendent Baugh, has been made superintendent of the Upper works. Powers Wick and Thomas Paget have been made assistants at the Upper and Lower Works respectively and W. L. Crouch has been appointed chief engineer of both plants.

The Consolidated Mfg. Co., Toledo, O., has gone into the hands of a receiver, and its affairs are now being managed by David Robinson, of the Ohio Savings & Trust Co. No cessation of activities, however, has been occasioned and trade is being cared for as usual, it being the expectation of the company to increase and care for its business in better shape than heretofore.

The Tuttle & Bailey Mfg. Co., 83 N. Tenth street, Brooklyn, N. Y., would be pleased to receive catalogs of metal and wood-working machinery, foundry appliances and general supplies. Address, Department G.

Coke Plant of the Semet-Solvay Co., Detroit, Mich.

BY AN EDITORIAL REPRESENTATIVE OF THE IRON TRADE REVIEW

The Solvay Process Co. and the Semet-Solvay Co., at their various plants throughout the country, produce annually over 2,000,000 tons of coke. At the village of Delray, on the outskirts of Detroit, coke ovens were first installed in 1901. These ovens have been increased in number and size until now they have an annual capacity of 250,000 tons. The fact that the Solvay Process Co. requires a large amount of coke in the manufacture of its other products, and because

FIG. 1.—MAIN OFFICE, SEMET-SOLVAY CO., DETROIT.

of its abilty to handle to advantage, in conjunction with its other operations, the by-products resulting from the retort method of manufacturing coke, led to the adding of coke ovens to the various plants. The plant at Delray is typical of all the company's works, and one is constantly impressed with the size of the undertaking and the opportunity to manufacture intelligently and economically.

Lay-Out of Plant.

The plant is situated on the Detroit river opposite Zug Island. The ground plan covers about two hundred acres, and extends from the river to the street a quarter of a mile back. The office buildings face the street. Between them and the coke ovens is the soda department which, despite the size of the coke oven installation, is the larger part of the industry. The coke plant is on the river side of the company's property.

Office Buildings.

The office buildings, one of which is shown in Fig. 1, face the street and are arranged in an open quadrangle, with the general office building on the right, a lodge for the office employes on the left and, in the middle, some 300 feet back from the road, a chemical laboratory. About 600 feet distant in one direction is the Solvay general hospital, between which and the rest of the office buildings nothing intervenes.

The chemical laboratory is a compact brick structure two stories high, well equipped, and arranged for individual work for each department of analysis. The chemical department is organized to make analyses of every step in all the processes, coke, by-product and soda. The coal is analyzed as it comes in on the cars from an average sample taken from six or seven parts of the load. This coal, which is almost entirely a West Virginia product, runs, approximately, in analyses:

Volatile Matter	25.00	per	cent
Carbon	70.00	"	"
Ash	6.00	"	"
Sulphur	.60	"	"
Phosphorus	.01	"	"
Moisture	2.50	"	"

After the coal has been through the crusher, and as the dust is ready to be charged into the ovens, it is again analyzed, so that the mixtures required for various kinds of coke are accurately ascertained. The general run of coke will have an analysis, approximately, as follows:

Volatile Matter	1.30	per	cent
Carbon	88.00	"	"
Ash	10.00	"	"
Sulphur	.60	"	"
Phosphorus	.02	"	"

Coal Handling Building.

Spurs of the Delray Connecting Railroad have been built around the ovens for conveniently handling the coal and coke. The coal is hauled to the plant and is dumped directly from hopper cars into a track hopper in front of the coal handling buildings partly shown in Fig. 2. A "Brown Hoist" car dumper is installed to empty the few old style cars which come in. The track hopper is provided with a reciprocating feeder which discharges the coal into a continuous conveyor to be carried up into the coal breaker building. Before reaching the breaker, it passes over a screen, through which the small lumps of coal pass. Most of the coal, as it comes from the car, is in the form of large lumps. These are discharged into a Bradford coal breaker, consisting of a rotary drum with internal inclined shelves, so that as the coal falls on them it is carried up to the top of the drum, and from there falls on sharp pricks, which break it up. From the breaker, it passes through a screen on the lower side of the breaker to a pit below. Those pieces of coal which do not break are rotated out of one end of the breaker onto a conveyor which carries them up an incline, on which a man stands picking out the slate and other foreign material. This coal is then dumped through a chute into a car. The coal which has been broken up and passed through the breaker falls on a belt conveyor and is carried along the incline shown in Fig. 2 to the coal bin building on the right. Here it is divided by separating chutes, so that one-half of it is dumped into bins in this building, and the other half is carried on a horizontal conveyor to a similar building on the left, the two coal bin buildings standing at the end of each set of 60 ovens.

The coal bins are arranged so that there is a separate compartment for the various kinds of coal used, into which the coal can be directed by a system of chutes. The bins have a capacity, at present, of 600 tons, but are being increased in size, so that they will hold about 1,100 tons. The conveyors have a carrying capacity of

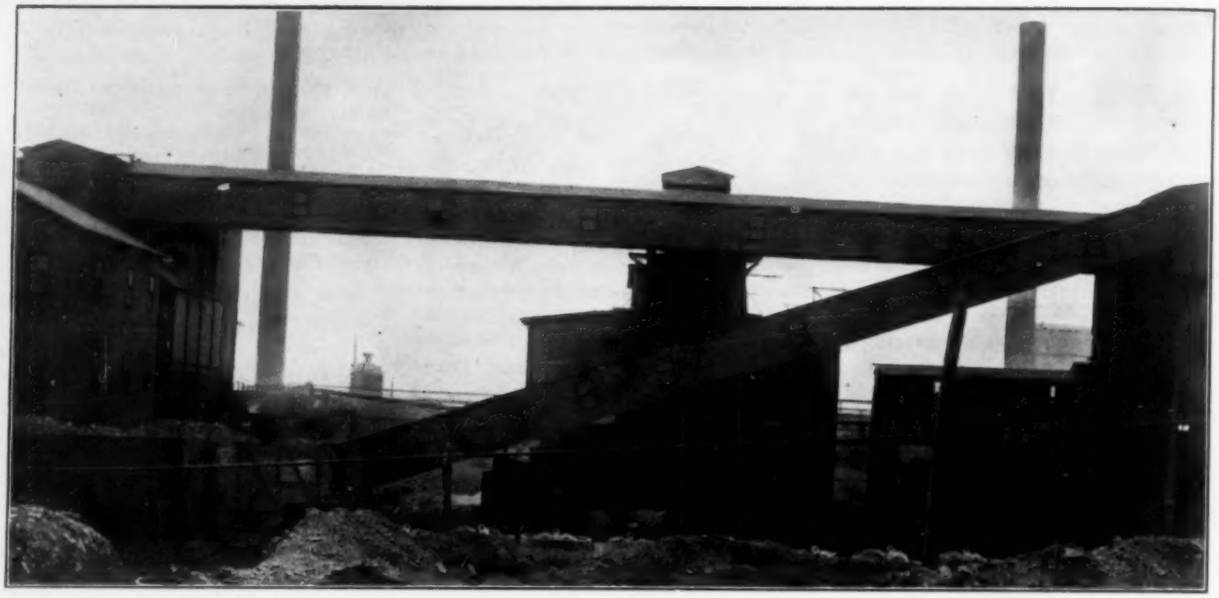


FIG. 2.—COAL HANDLING BUILDINGS AND CONVEYORS.

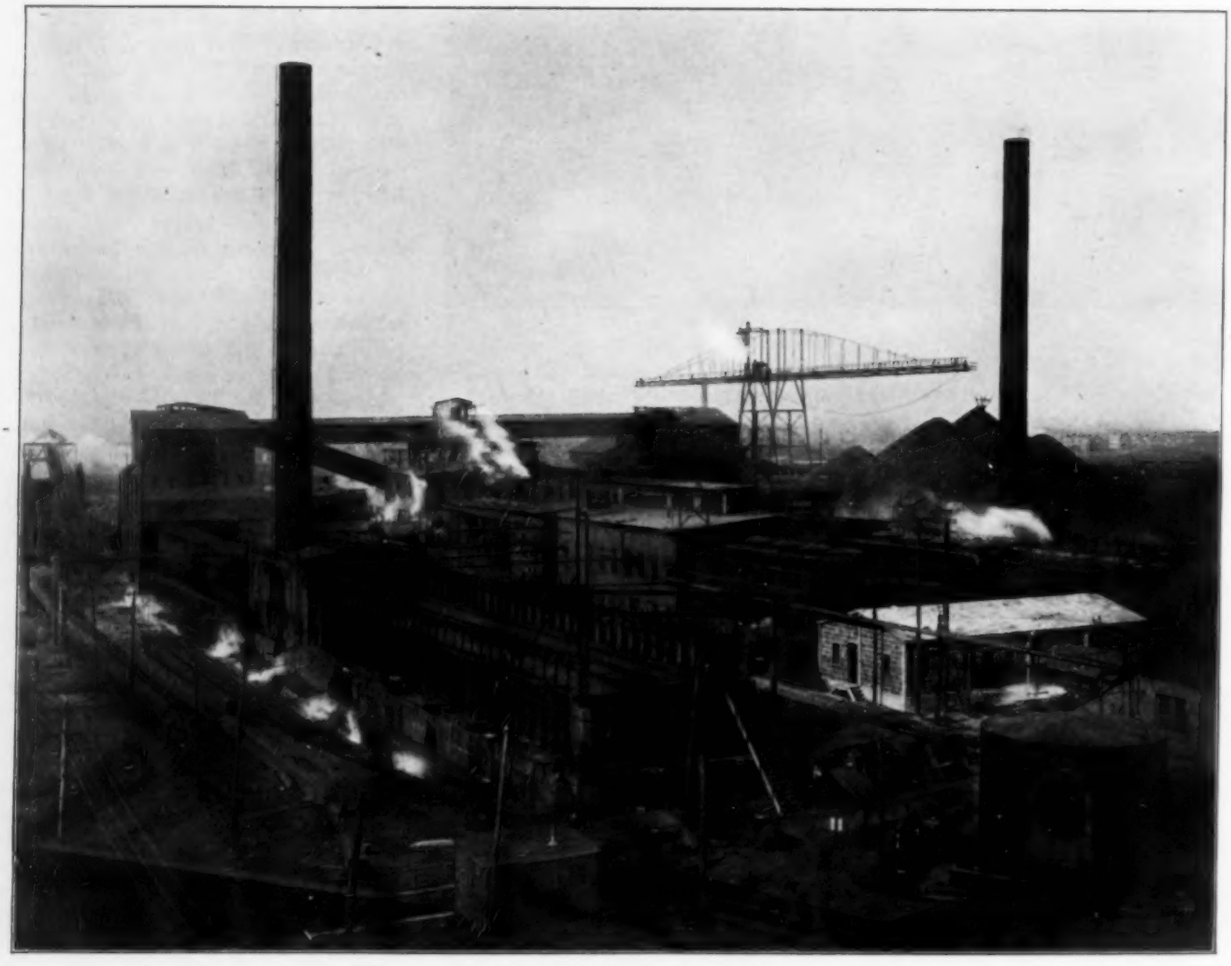


FIG. 3.—GENERAL VIEW OF COKE PLANT, SEMET-SOLVAY CO., DETROIT.

240 tons per hour, but are now run at half that rate. At the bottom of the coal bins in either building are hoppers which permit of the coal being carried through chutes into a pulverizer. These spouts have their outlet into the pulverizer at a common point on the floor below, and the rate of flow of coal into the pulverizer from the bins containing the various kinds of coal can be so regulated by a gate in the chutes that the percentage of each variety is accurately determined. The pulverizer consists of a number of arms centered on a horizontal revolving shaft. A slot in the arms permits of a radial movement so that a pounding action is obtained by which the coal is crushed. In connection with the pulverizer, is a magnetic separator, which separates out of the coal many materials that would detract from the value of the coke. In order to reduce the dust in the building, about 1 per cent of moisture is added to the crushed coal before removing it from the pulverizer. This fine coal is then carried by an elevator to the floor above, into bins from which it can be discharged directly into the larries. The larry floor is on a level with the tops of the ovens, so that the fine coal is conveniently transported from the storage hopper to the oven.

Arrangement of Ovens.

The general arrangement of the two blocks of ovens is in the ordinary manner, like a large letter U, the coal handling buildings being at the closed end of each leg. The two legs of the letter represent the two blocks of 60 ovens between each 30 of which are located the two boiler houses. Fig. 3, a bird's-eye view of the entire plant, shows this quite distinctly. Looking toward the end of the ovens from the coal handling buildings, an electrically operated pusher shown in Fig. 4 runs on a track at the left hand side of each row. On the other side, a track is provided on which steel hopper cars may be run parallel and close up to the ovens, so that the charge of coke when pushed out falls directly into these cars, which are then hauled by a small electric locomotive over to a platform, on which the coke for foundry purposes is forked over and wheeled into cars for shipment. Between the two rows of ovens is the gas washer building, and at both ends of it are located the condensers, into which the gas is led from each set of 30 ovens.

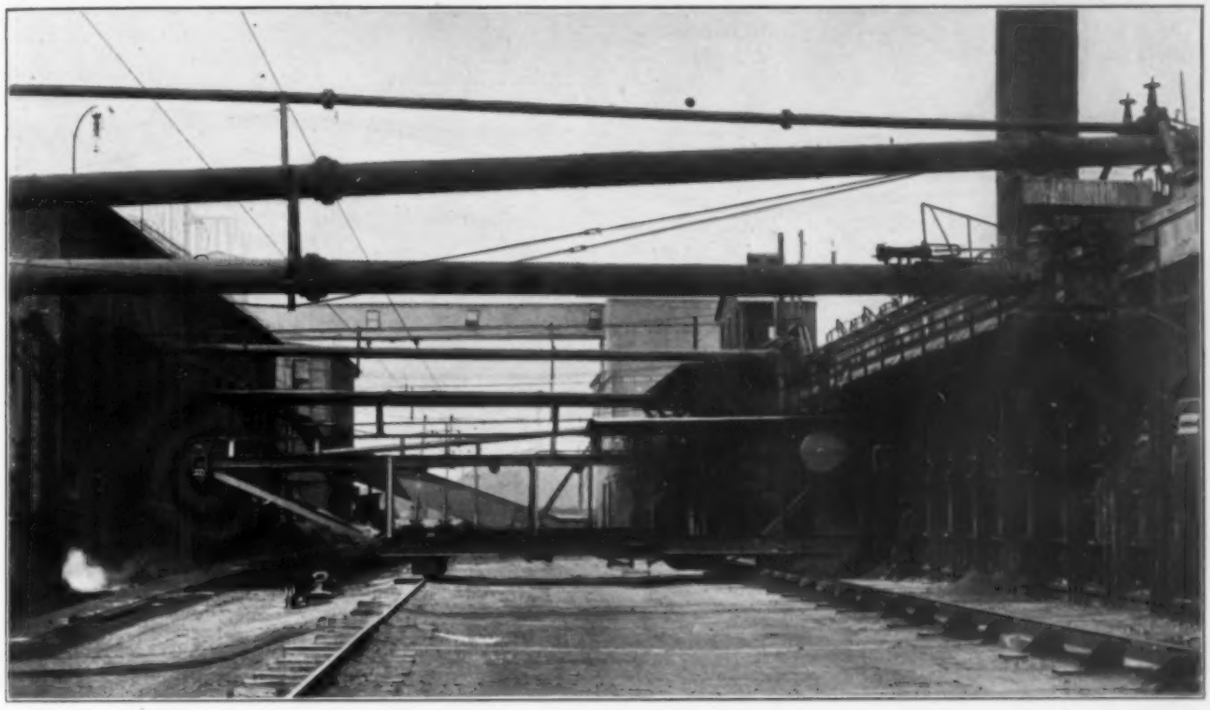


FIG. 4.—ELECTRIC PUSHER LEVELING A CHARGE OF COAL.

Oven Construction.

The ovens have horizontal flues one above the other, which is the Semet-Solvay system as distinguished from the vertical flue ovens. The advantage claimed for the horizontal over the vertical flue is that the temperature, at any point, may be ascertained and maintained more readily. The ovens are of the ordinary Semet-Solvay type, are 16 inches wide, 7 feet deep and 35 feet long, and receive a charge of coal of about seven tons. The amount of coke pushed out is about five tons, and requires, at the present rate of running, some 21 hours for coking.

Heating.

The heating system of the ovens is as follows. The fuel gases from the ovens, after passing through the tar mains and condensers, and through the gas washers, are brought back through a pipe, from which the connections to the individual burners in the flues, lead. The gases pass up to the burner, are mixed with air, and are ignited in the flues. A large duct carries the waste gases to the boilers in the power plant. They are there used for heating the boilers, and are then drawn out through a stack. The return gas duct conveys heat to the air main, which parallels it, and so heats the incoming air. The air for combustion in the gas burners is supplied through connections from the underground main, which runs the entire length of the ovens and in which the air is heated. The heating of the flues is accomplished by having a burner at one end of the bottom flue on the pusher side, another in the second flue on the opposite end, alternating throughout, in this way. A sight hole may be placed at the end opposite the burner, and a complete view of the heating operation thus obtained.

Operation.

Each oven is charged through openings in the top from larries, which run along tracks, extending from the coal bin building to the other end of the 60 ovens, running over the boiler

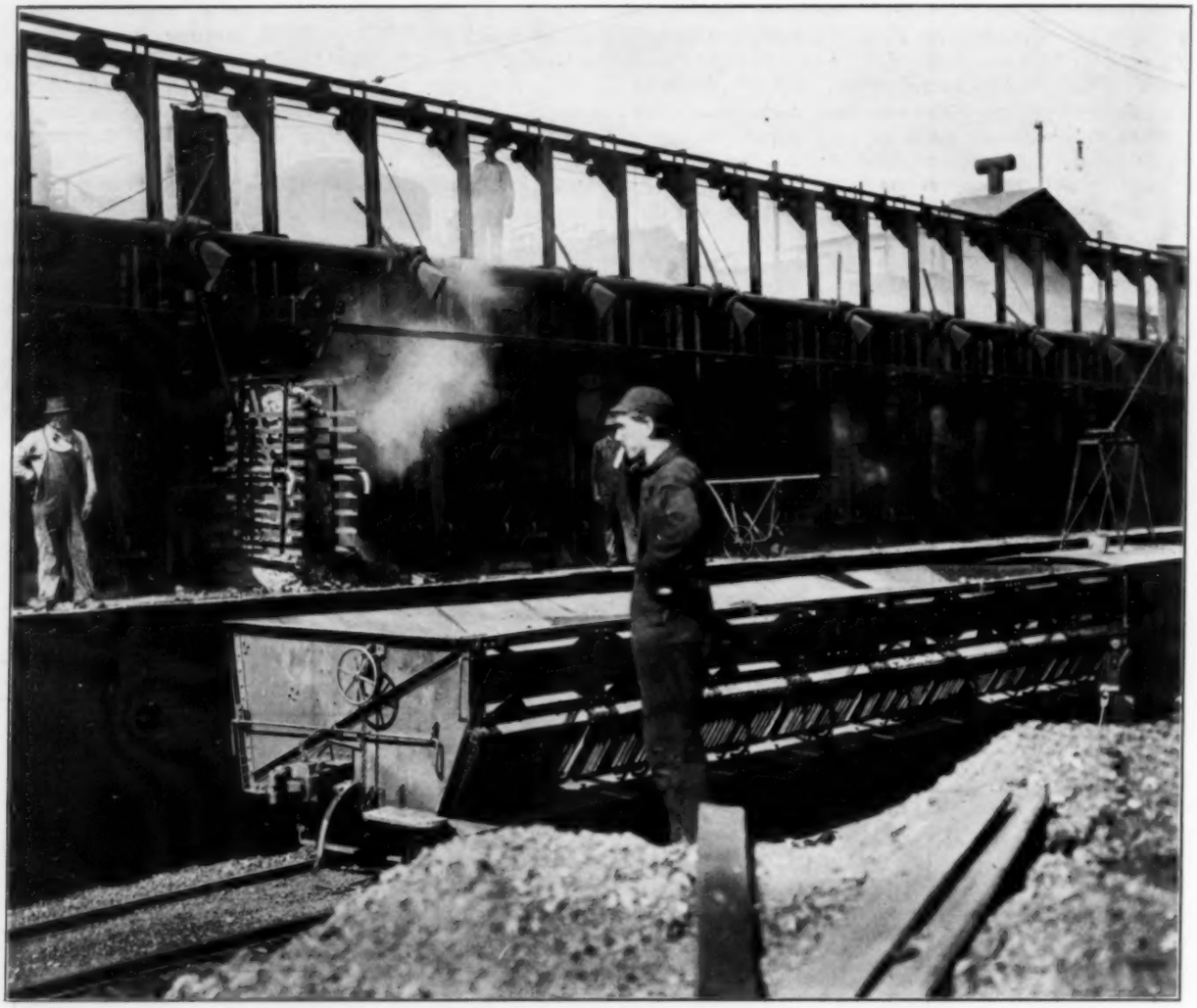


FIG. 5.—PUSHING AN OVEN OF COKE.

house. When the charge is dumped from the larries through the openings into the oven, mound shaped piles of fine dust result. The pusher, which is also provided with a leveling bar, operated by an electric motor, is run in front of the oven. The leveler, which is a long arm, is run through the pile of fine coal, leveling it to the height at which the coke will stand, thus also permitting the free movement of gases. As the coal cokes from the side heating walls, inward, there is left in the middle, a distinct cleavage of the entire charge, and when pushed out the coke breaks up into lumps, of sizes admirably adapted to blast furnace and foundry practice. As the incandescent coke is falling into the car, which is moved along so that the coke is distributed evenly, it is quenched in a manner which leaves the least possible moisture in the coke, and thereafter, a sufficiently long time elapses before the coke is shipped, so that almost every trace of moisture is evaporated. The coke intended for blast furnace use is

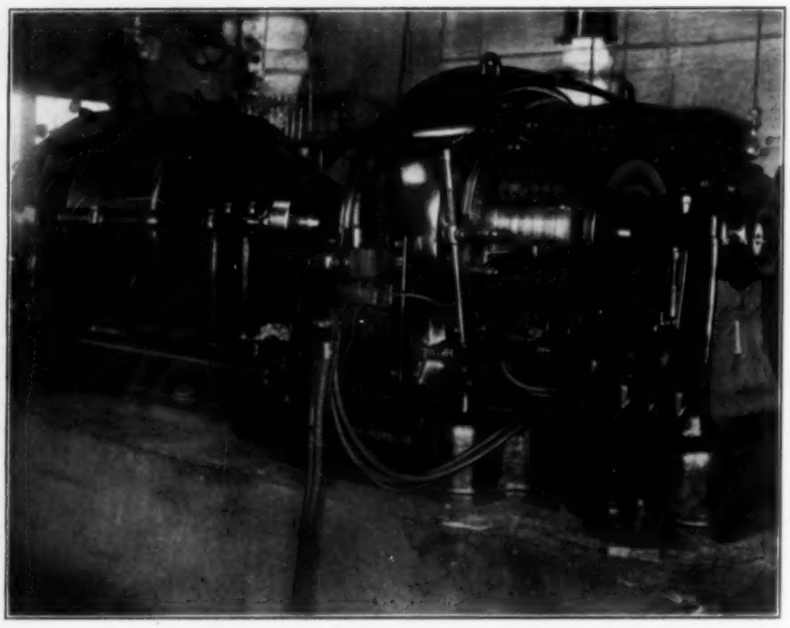


FIG. 6.—ONE OF THE TURBINE UNITS IN THE POWER PLANT.

"run-of-oven" product from which the breeze has been removed, but the coke for the foundry is dumped out, as mentioned above, onto a platform raised

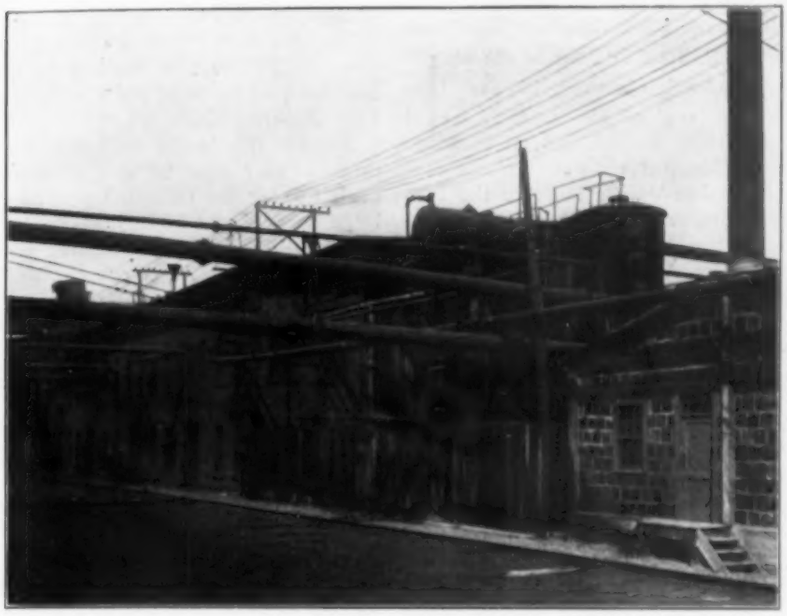


FIG. 7.—WASHER BUILDING WITH CONDENSERS AT ONE END.

to the height of the ordinary freight car door. There it is picked over thoroughly by a force of men, who fork it into wheel-barrows, in which it is carried to the freight cars to be shipped. For shipping coke about Detroit, in which city it is largely used, the company uses a special rack car of its own design. The time elapsing from the pushing of one oven as shown in Fig. 5 to the discharging of the next, in which interval the coke has been quenched, hauled from the ovens to the dumping platform and the car returned, is a little more than nine minutes. For domestic purposes the company uses that part of the coke which is too small to be used in the foundry, together with other parts of the coke unsuitable for either foundry or blast furnace. These are carried on a conveyor through a breaker, and thence over another conveyor to a domestic coke storage elevator, whose capacity is from 2,000 to 4,000 tons.

Power Plant.

The power plant, is located in an adjoining building, and consists of an installment of 300-horsepower De Laval turbines, two in number, with direct connected Western Electric direct current generators, with a rated capacity of 200 kilowatts each. Fig. 6 shows one of these units. A Worthington condenser is used with a centrifugal pump. A remarkable feature in this connection is the fact that with the barometer at 29.2 inches a vacuum of 28.4 inches is regularly obtained. This condition is somewhat in contrast to the very prevalent belief that centrifugal pumps are not adapted to maintaining a wet vacuum. There is also being installed a new centrifugal pump, direct connected to a turbine for general circulating purposes.

Handling of Gases.

There are in all 16 condensers, eight at each end of the washer building, as shown in Figs. 7 and 8, so arranged that half of them are used for the first or rich gases coming off from the ovens, and the other half for the later products and fuel gas. This distinction is accomplished by having above the oven on the pusher side two valves for each oven. By the proper opening and closing of these, gas may be directed through a proper channel into the proper condensers. The first gases are, as is well known, of dirty yellow color, rich in methane and illuminants heavy with tar. A hydraulic main runs along the top of the ovens on the same side as the valves through which the gas passes before going to the condensers. The heavy gases which come off first are afterward enriched with benzol, so that their natural illuminating value is increased to any desired candle power. This gas is then sold to the City Gas Co., which purifies it of sulphur and uses it for illuminating purposes. All the gas evolved is treated for by-products, which are disposed of elsewhere by the Solvay companies. The chief consideration at the Detroit plant now is the production of foundry coke, while the by-product part of the work is a secondary consideration. The benzol for enriching the illuminating gas is obtained from other plants of the Solvay company.

Washer Building.

In the washer house, Fig. 7, are six vertical washers, built in horizontal belts or segments. In each segment there is an umbrella shaped partition,

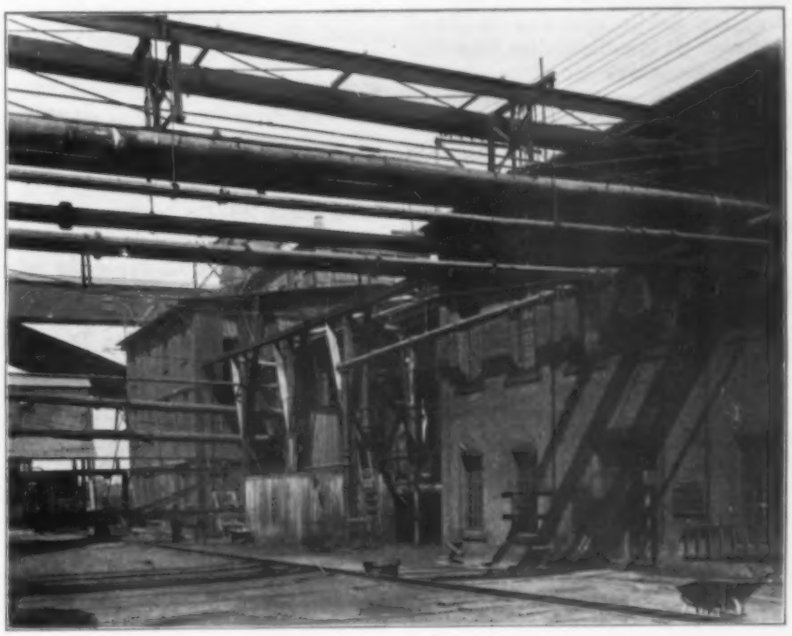


FIG. 8.—SHOWING CONDENSERS AT OPPOSITE END OF WASHER BUILDING.

which diverts the gases through the water running down over them, thus removing a large part of the physical impurities. The exhausters used in

this building are the Connersville and the Green types. The two boiler plants are rated at an aggregate of 1,800 horsepower. Only about half of this is available, however, for with the method of heating, using waste gases, the full capacity of the boiler is not developed.

The entire plant is being continually enlarged and among the other buildings now being erected is one, half of which is to be devoted to the purpose of enriching the illuminating gas, and the other half to be a locker and wash room for employes. The company has its own cars, so that it is independent of any shortage in that direction. The company also has its own locomotives and nine miles of trackage, its own yard and switching force. It has its own police force and post-office department, and has built a dining hall at the works for its employes. Concrete tunnels have been built under every spur to avoid the dangers attendant upon so much switching. The "Solvay" coke, through the agents of the company, Messrs. Baird & West, Detroit, is being shipped not only to neighboring points, but as far east as Buffalo and nearly to the southern boundaries of Ohio. It competes with other cokes in those districts, and has built up for itself a splendid reputation.

German Canal Scheme.—A project of inland navigation on a large scale is occupying public attention in South Germany. It is nothing less than connecting the Rhine with the Danube by means of a canal and by deepening the channel of the Neckar river, at an estimated cost of $10,000,000. It is pointed out that when this canal is finished, vessels of about 1,000 tons burden will be able to convey cargo from the North Sea to the Black Sea on an uninterrupted waterway. The Wurtemberg government has set aside a considerable sum for preliminary surveys.

Production of Coke.—The estimated production of Connellsville coke during the thirteen weeks making up the first quarter of the year was 3,655,045 tons, over 300,000 tons greater than during the corresponding period in 1905 and more than 1,300,000 tons in excess of that for 1904. Shipments from this locality during the first quarter required 184,444 cars, of which 55,764 were destined for Pittsburg and the river, 103,744 to points west of Pittsburg and 24,936 to points east of Connellsville. The number of cars required in the corresponding period in 1905 was 173,059 and in 1904, 115,254.

IMPORTANT ADDITIONS

Made to its Holdings by the Cleveland Cliffs Iron Co.

(Special Correspondence.)

Ironwood, Mich., May 9.—The Cleveland Cliffs Iron Co., one of the biggest "independent" operators in the Lake Superior region, has recently added considerably to its mineral holdings on the Marquette range. In one case it has taken over a lease to the Iron Duke property for a term of ninety-nine years. The instrument is executed by Albert M. Bigelow, president of the Iron Duke mine, a corporation organized under the laws of New York, but which never maintained an office in Michigan. The consideration named is "$1 and other valuable considerations." The Iron Duke lands are 160 acres in extent and adjoin the Cleveland Cliffs company's holdings northeast of the city limits of Ishpeming. Since 1899 they had been held under lease by the Marquette Mining Co., of which D. R. Hanna, of Cleveland, is president. The tract, however, has never been developed. By the terms of the lease the Cleveland Cliffs company will pay the sum of five cents a gross ton for all iron ore taken from the Iron Duke lands.

In the territory a few miles southwest of the city of Marquette, a field in which indications of ore have been found, but which has never been systematically explored, the Cleveland Cliffs company has taken over a tract of some 1,600 acres of land from the Pittsburg & Lake Superior Iron company, and will at once test it with the diamond drill. According to the terms of transfer, the Pittsburg & Lake Superior Co. reserve an undivided one-half interest in all the mineral rights, it being expressly stipulated in a contract entered into between the two corporations that should producing mines be located at any time within the tract, the Pittsburg & Lake Superior Co. is to be paid a royalty of fifteen cents a ton for all ore assaying 58 per cent in metallic iron. Ore showing less than 50 per cent iron is to be paid for at the rate of five cents a ton. It is also provided that in case a mine is opened either company is to have the first right of purchase from the other, the price for an undivided one-half interest to be agreed upon mutually. It has been the popular opinion that the district being outside the mineralized area of the Ishpeming and Negaunee fields, it had little prospect of witnessing the development of mines, but the fact that the Cleveland Cliffs people have found it desirable enough to become interested is held to indicate that they have knowledge of mineral values not shared by the general public. The general trend of their Marquette range exploration of late years has been in that direction.

The Cleveland Cliffs Co.'s new Austin mine, to the south of the new field, is developed on lands of the Pittsburg & Lake Superior Co.

Another step in the movement instituted a year ago by the Cleveland Cliffs Co. for the reforestization of its large area of cut over lands will be the establishment of a forest-tree nursery at Coalwood, Alger county, Mich., this spring. The work is already under way, and within a few weeks there will be about four acres of two year old white pine seedlings under cultivation at Coalwood, as well as other varieties of forest trees transplanted from the Negaunee nursery of the company. A ten-acre wild cherry orchard set out at Coalwood last spring stood the winter very well. But few trees were killed by the cold, although some were broken down by the snow. Twenty thousand Norway spruce plants set out in the vicinity of the company's private fish hatchery at Munising also withstood the winter in excellent fashion. Trees will be planted this spring in the vicinity of Trout bay, on Grand island, Lake Superior, off Munising. At least 10,000 white pine, Norway pine and Norway spruce trees will be set out at that point. The forestry work of the company in Alger county is in charge of two experts, graduates from the Baltimore forestry school.

CONCRETE FIRE TESTS.

The British Fire Prevention Committee have issued two reports, Nos. 107 and 108, dealing with fire tests made on a floor constructed of material generally available, and consisting of rolled steel flange beams, reinforced by light steel joists, and Thames ballast concrete, the floor being designed to carry a load, including its own weight, of 392 lbs. per square foot. Towards the end of the test the concrete between the cross joists began to fall, and the wooden floor on top became ignited. At the conclusion of the test the lower flanges of the beams were seen to be red hot. Eventually nearly the whole of the concrete between the cross joists in one bay fell, the wooden floor on top igniting. The maximum permanent deflection of the floor as recorded four days after the test was 4⅝ in. (0.12m.). The concrete at the junction of the broad flange beams and the cross joists did not crack or break, and none of the joists was dislodged, twisted, or bent. Both fire and water passed through the floor, which was badly damaged.—*London Times.*

OPEN-HEARTH STEEL CASTINGS,—V.

BY W. M. CARR.

Basic Practice.

The problem of charging into a basic open hearth furnace phosphoritic and otherwise impure materials, converting the same into good castings, offers many interesting features. To get satisfactory and uniform results, certain conditions require close attention and niceties of adjustment. When with a suitably lined basic hearth and the proper melting stock it is possible to begin with a high initial phosphorus and sulphur content and end with an almost complete removal of them, it is clear that the chemical history of the manipulations in conversion is more varied than that of an acid heat. As already stated 95 per cent of the phosphorus and 60 per cent to 75 per cent of the sulphur can be eliminated in a basic bottom; there is then offered an opportunity to produce a class of output with a very low composition. Concerning the other constituents the conditions in regard to their removal during conversion and their presence in finished product are practically the same as in acid castings.

Given, then, a basic bottom and melting stock, the changes in a heat will be considered. The function of the basic bottom is only a refractory one and the material entering into it plays no part in the direct purification and conversion of stock. The calcerous slag is the active agent and the bottom must be of such material that the action of such a slag will have the least possible cutting effect. To minimize that effect, the best results will be obtained with a magnesite lining prepared as previously described. Limestone or calcium carbonate forming the slag and classified as a "base" will not flux with magnesite also a "base." That is, an admixture of two or more bases will successfully resist high temperature or those common to steel melting; but a combination of an acid (silica, etc.) and a base (lime or magnesite, etc.) will at similar ranges of temperature readily fuse. Hence the metallurgical necessity of the hearth lining being of a similar character chemically to that of the slag which may be formed in open-hearth melting.

Silica being greedy for any base and always ready to fuse in the presence of a base, the life of a basic hearth will be subject to its influence, therefore it is important that the substance be allowed to enter the charge only in the smallest amounts possible. Through the charge it will be carried in as silicon (subsequently changed to silica) and sand adhering to the stock. With pig-iron cast in chills, the amount of sand from that source will be practically nil. Defective castings charged directly from the molding floor may have more or less sand on them and unless they are carefully cleaned to free them from burnt cores, etc. there will be danger of undue hearth scorification both on slag line and bottom, causing an increased use of refractories for patching.

Theoretically silica or silicon should be absent in basic stock. Practically it is not free from either, but the condition is none the less subject to control. Therefore in selecting pig-iron for basic melting the maximum percentage of silicon is given as 1 per cent. The amounts of that element in the various kinds of steel scrap are so low that the figures are negligible. Assuming the total charge to be equal parts of pig iron and steel scrap the initial silicon carried in by stock will average about 0.5 per cent. It is good practice to keep in the neighborhood of that figure, but a slight variation or increase will not be a serious objection. If there should be on hand some "off basic pig iron" that is high in silicon (over 1 per cent), or high in sulphur (over 0.05 per cent,) a small quantity can be charged at the rate of about 1 per cent of the charge and will have but a very slight effect upon the desired initial composition.

In regard to sulphur and its position in the composition of the charge, it does not seem necessary to be very rigid as to how much can be considered dangerous. Actually standard basic pig iron, while rated at 0.05 per cent maximum carries more than that because of the generally accepted method of analysis giving uniformly low results. Were a more tedious method and a more accurate one employed, the figures on sulphur would generally be nearer 0.07 per cent than the standard stock requirements; hence the amount of sulphur actually going into a charge is really higher than shown by the individual analyses of the pig irons forming part of it. The same differences between the apparent analyses and actual content of sulphur holds true on various grades of pig iron until very low amounts are reached. In the light of recent practice, the influence of sulphur in finished product is not regarded as harmful as it once was. There is therefore no good reason to place a strict limit on how much shall go into a charge. On an average the total amount will rarely go above 0.04 per cent. Rail scrap frequently carries 0.07 per cent and over. The pig iron will range from 0.01 to 0.05 per cent, and with many kinds of steel scrap to select from, ranging from 0.02 per cent and higher, it will not be difficult to keep the initial sulphur at or about the average stated if so desired. In the writer's experience there was a time when it was considered bad practice to have the initial sulphur exceed 0.03 per cent, and the aim was to get lower. (At this point the question as to the influence of sulphur will not be considered, but will be deferred to a subsequent section). With a normal basic slag and proper conditions, much higher ranges of initial sulphur can be safely handled. There will be almost complete elimination in conversion, so that specification for finished product can be kept within easy reach even with an initial sulphur of 0.07 per cent.

Concerning phosphorus and keeping in thought the ulterior limit in the analysis of finished product, it is as well not to make the entire pig iron charge all high phosphorus material. While the figures on standard basic pig iron are 1 per cent and were drawn for ingot practice, for castings it is better to have at least two kinds of basic pig of which one may be low and one other standard. A brand carrying about 0.25 per cent of phosphorus or less is not difficult to procure. With a charge of mixed brands of pig iron, and the usual varieties of scrap, it will be possible to keep the initial phosphorus of the charge low. During the progress of conversion and with a strongly basic slag, there will be practically a total absorption of phosphorus by it from the bath. At the end of the heat in recarburizing with ferro-silicon, etc., there will be a tendency on the part of the phosphorus to re-enter the metal, depending in a great measure upon the amount of that element charged, and the basicity of the slag. There is always some re-absorption, and it is greater with all high phosphorus pig than when it may be diluted with low phosphorus pig iron. Hence the need of mixing the pig iron in regard to phosphorus content. Average practice will give a negligible reabsorption if the initial phosphorus is about 0.1 to 0.3 per cent.

In addition to the elements enumerated, there is always more or less manganese carried in with the stock. In basic melting it is useful in several ways. One function is to assist in maintaining a necessary fluidity of the slag, and it will exist in that body principally as an oxide, resulting from the metal in the charge. It also aids in the removal of sulphur in the bath, and at some period during the melting unites with it, forming a readily fusible sulphide of manganese which floats upwards, and either dissolves in the slag or upon reaching the surface and becoming exposed to the flame action, may be oxidized or volatilized. The action of manganese, however, is not quite clear, but from actual results there is no doubt that its influence in de-sulphurizing is quite potent. In that respect its operates in conjunction with the Ca O (lime) furnished by the limestone, which is also an active

de-sulphurizer. It has been observed that a moderately high initial manganese assists in washing the bath of dissolved oxides always present in metal which has been subject to the impinging action of the flame before the period of liquation has been reached and the mass disappears below the slag. The deoxidizing effect will not begin until the mass has partially or entirely fused and is covered with a layer of slag. Deoxidizing will take place by the union of silicon and carbon with the oxygen and whatever manganese may be present in excess of that which may unite with the sulphur will considerably augment the effect. The joint operation of the three elements will certainly give cleaner metal. With ordinary melting stock the average or initial manganese will be about 0.5 per cent, but if it is possible by the use of a high manganese pig iron to raise that nearer 1 per cent, the results or deoxidizing effect will be more satisfactory. Or in the absence of that kind of melting, stock, the deficiency can be made up with spiegeleisen, an alloy carrying 20 per cent of manganese, or a certain amount of manganese ore will be useful for the same purpose, if charged at the proper time,—before the first portion of metal. It is recommended, however, that the needed manganese be carried in by high manganese pig iron, because it is possible to get a better distribution of that element than by adding a small quantity of the alloy mentioned to make up any deficiency. For that reason it is good practice when purchasing melting stock, to have on hand pig iron carrying between 1.5 to 2.5 per cent manganese.

Since pig iron generally contains 2.5 to 3.5 per cent total carbon and with 50 per cent pig and 50 per cent steel scrap the initial carbon of a charge will be from 1.5 to 2 per cent. Whether the carbon may be in the combined or graphitic form is not considered, because when the pig iron is liquid, it is all in the former condition irrespective of the constitution before melting. It will be observed that there is a difference between acid and basic melting in regard to the percentage of pig iron in the charge. In the former there will be 15 per cent, but in the latter 50 per cent. The reason for the difference is due to the larger volume of slag formed in basic melting, which requires a considerable portion of the heat units to penetrate it, to promote the necessary fluidity of the bath of metal below. As has been pointed out, the amount of carbon present largely controls the melting point of iron and steel and with a high initial percentage of it in a charge of cold stock, it is possible to acquire liquation at a relatively low temperature. Were there a low initial carbon as in acid melting, there would be much trouble with viscosity of the bath, because of heat absorption in the heavy body of basic slag. With the bath melted at a high range of carbon, the necessary thermal conditions are comparatively easy to attain. A high carbon at melting, between 0.5 to 0.8 per cent, is considered good practice; further, it means a prolongation of that period in which deoxidization or clarifying of the bath occurs. Whereas a lower carbon at melting would shorten that period, and at the same time there would be undesirable conditions likely to arise, such as low temperature of bath, and overoxidized metal, both tending to give bad results in product. Should a heat melt soft (low carbon) it can be "doctored" by adding cold pig iron, and the temperature raised by flame adjustments, but recourse to such treatment is always dubious as to the outcome.

The foregoing elements of the charge being adjusted in accordance with general practice, the next step will be to consider the slag composition, which is to play an important role in the conversion and purification of the bath. In contrast to acid melting, the slag will be one highly charged with lime, a substance already shown to be objectionable in an acid hearth, but desirable in treating basic stock. The normal composition of a basic slag will not be reached until the stock has melted and the slag attained its maximum fluidity, which period occurs during the second stage of a heat that for convenience may be designated "Metals Melted." Taking as an average the analyses of twenty samples of slag selected from various normal heats in the second stage, the following can be considered the usual composition of a basic open-hearth slag.

Silica	16.00 per cent.
Ferrous oxide	22.00 per cent.
Lime	40.00 per cent.
Magnesia	8.50 per cent.
Manganous oxide	8.50 per cent.

The foregoing analyses can only be regarded as applying to the conditions of practice, existing when they were made and not as a rule to follow in all cases, but under general conditions they may serve as a guide. In order to form a basic slag there are several important conditions to take into account. First, enough lime must be added to combine with or neutralize the silica, which will result from the oxidization of the silicon carried in by the metals, and that carried in mechanically as sand; otherwise, there would be a thin slag and an undue cutting of the hearth by the silica. Second, too much lime must be avoided which would tend to form a thick, pasty slag that would cause trouble in tapping the furnace or bring about a heavy consumption of fluorspar to flux it.

There is a medium to be sought between basicity and fluidity and at the same time the function of the slag in absorbing and retaining phosphorous must not be overlooked. The measure of the latter action mainly depends upon the amount of lime in excess of that united with the silica, lime in a basic slag being the active de-phosphorizing agent. As to fluidity, that condition in addition to the influence of silica will depend upon the varying amounts of manganese in the stock which enters the slag as an oxide. Oxide of iron operates in the same manner and is always present independently of that added as iron ore. The iron oxide of the slag will result from the rusty coating on the stock and the impinging action of the flame during the first stages of a heat. In general terms the higher the content of silica the greater the fluidity, but at the expense of de-phosphorization and hearth. Fortunately the medium can be found because of the presence of iron and manganous oxide, since a law seems to exist in slag formations that fluidity or fusibility is controlled by the number of bases present. So, assisted by manganous oxide and iron oxide in the presence of lime and silica, desirable slag conditions in basic melting can be attained without much difficulty. In addition to the elements given in the slag analyses there may be small negligible quantities of alumina and alkalies. The amount of magnesia results mainly from hearth cutting. To forecast the exact amount of lime to be added solely on theoretical grounds is not easy, because the total available silica cannot be accurately determined owing to the uncertain quantity of sand adhering to the stock. Whatever silica may be available in the stock will require at least enough lime in the ratio of 1 to 3 to satisfy it. Also the purity of the limestone, generally used as a carrier for the necessary lime of the slag, must be taken into account and any silica this may have will depreciate the available lime in the same degree. Therefore, the nearer a limestone approaches a pure carbonate of lime the greater the efficiency. In actual practice the amount of limestone required to form a normal slag will vary between 7 and 15 per cent of the weight of the charge. With standard melting stock and a pure limestone it will be comparatively easy to get satisfactory adjustments. In the hands of a skillful operator assisted by the chemist the behavior of a heat can be followed at any desired stage, so that untoward conditions of purification will be within control. Agencies are constantly at work in slag formations following the laws of attractions and affinities which present problems of scientific interest. To solve their complexities would be a difficult task.

If an open-hearth furnace be regarded as a chemist's labratory experiment on a large scale, and viewed from a chem-

ist's standpoint, the delicacies of definite chemical reactions are not obliterated because of the very hugeness of a furnace. Whether the operation be conducted on a minute scale or on a larger one, definite laws are omnipresent. Could the operator bear in mind that he is handling tons of material with forces equally potent as in the chemist's ounces, he would stand in awe of them. Careful, intelligent work combined with practical experience makes it possible to put basic practice in the same plane of efficiency as acid melting notwithstanding prejudice to the contrary existing in some minds.

Having determined upon the amount of limestone to form the basic slag, the next step will be to consider the order of charging. With a basic hearth prepared as outlined in previous sections the method of charging may be conducted as follows: First the stone is spread over the bottom in as regular layers as possible, followed by the lighter sections of scrap, which should be more or less rusted, or if not rusty, some iron ore may be added with it to make up the lack of oxide to assist in subsequent slag fusibility. Then two-thirds of the pig iron distributed as evenly as possible, which may be followed by the remainder of the scrap. By this time the furnace will be well filled with bulky stock, and it may be necessary to allow the flame to partly melt it, thus, forming room for the final addition of pig iron. The serious part of melting now begins and at this stage the finished product in regard to quality will be greatly influenced by the manner in which the exposed stock may be subjected to flame action. There will be a desire on the part of the operator to get the heat out of the furnace in record time and with speed in mind the temptation to use a sharp, hot flame will be strong. On the other hand, a soft, mellow flame will not melt as quickly as a sharp one, yet the character of the product will be better than under the first named conditions. In one instance the bath will be highly charged, when melted, with dissolved oxides and in the other instance less so. It is not possible under any conditions to melt a mass of pig iron and steel scrap without some formation of oxides, and their subsequent solution in the bath, so long as it remains uncovered by a protective layer of slag. Good practice requires that there be a dividing line between speed and slowness, a sharp flame and a soft one, and that object is a difficult one to reach. The quantitative expression of dissolved oxides cannot be stated, but their influence can be detected in varying degrees. That such conditions do exist is a fact, and the conclusion is based upon careful observations and research, the results pointing undoubtedly to the influence of the flame action whether gas or liquid fuel may be used and also the amount of initial carbon present in the stock. Oreing during the second stage or "Metals Melted" also may aggravate the evil. That it is an evil, will be pointed out, and, one not fully appreciated or understood. To it can be traced the non-success and consequent prejudice against basic melting, because, in some instances, it has been found in certain physical requirements that basic steel was not as good as acid steel for castings. In other words, expressing the difference between basic and acid steel in regard to certain physical properties, basic steel is more likely to carry dissolved oxides than acid, provided care has been taken to guard against their introduction or formation. Differences in chemical composition can only exist in the amount of sulphur and phosphorous for a given grade of product and the said differences being too small to exert any great influence, no cause can be assigned other than the one mentioned in studying the contrasting physical properties of both classes of steel. The condition of over-oxidization is not so liable to present itself with a gas flame, but even such a flame can be so adjusted as to abuse the stock. With an oil flame the danger is greater, because of the intense blow pipe effect of the oil burner. In experienced hands, however, quality duly regarded, normally, the oxidizing effect with any kind of fuel need not be excessive.

Under flame action in a fully charged furnace the stock will soon begin to melt and it will be observed that the melting of the pig iron goes on quite rapidly, dripping to the hearth in small streams, while the steel scrap melts at a slower rate, and in melting, the liquid steel frequently scintillates or burns forming either vapors or solid oxide. The dripping pig iron lessens that action, more or less, by protecting the lower carbon steel stock. The melting proceeds gradually, and the mass decreases in bulk and passes below a layer of rapidly forming slag. At this time, however, the slag formation is not entirely complete, but will be found to consist mostly of silica and iron oxide with comparatively little lime, the temperature of the furnace at this point not being sufficiently high to thoroughly dissolve the lime still resting on the bottom of the furnace. The composition of the slag at this period is practically an acid one and results from the sand of the stock and the silicon of the metals, since it is one of the first elements to submit to oxidization. Samples taken from the first portions of melted metal have shown a high sulphur content, much higher than that carried in by the stock. The cause can be attributed to the absorption of sulphur from the flame. During the first stage but little information can be ascertained as to the changes which may take place in the composition, because the mass is a conglomeration of pasty semi-liquid pig iron, steel and slag.

AGENCIES CONSOLIDATED.

In addition to the changes in the New York sales office of the Republic Iron & Steel Co., and the Tennessee Coal, Iron & Railway Co., a number of other consolidation changes became effective May 1. At Chicago the offices of the latter company in the Rookery have been abandoned and James E. Hubbert, western sales manager of the Republic company, will hereafter have direct charge of the sale of Tennessee pig iron, rails and other products, with A. H. Carpenter, formerly local manager, as his assistant. At St. Louis, Dwight C. Guthrie will be manager of sales and N. C. Durie, assistant. At Cleveland, C. T. Johnson, sales manager for the Republic, will look after the interests of both companies, with George D. Evans as assistant. At Cincinnati, M. E. McKee, will be manager of sales for both companies and Willard Wilson, who has represented the T. C. I. Co., will return to Birmingham, as assistant general manager of sales for that company. It is understood that the territories of each of the sales agencies will be continued on the lines heretofore prescribed by the Republic Iron & Steel Co. This step has been in contemplation for some time but is somewhat in the nature of a surprise as it was not expected at so early a date.

Plenty of Prosperity.—President Starbuck of the New York Air Brake Co., who has returned from a six weeks' tour of Panama and the West Indies, sees only prosperity in present conditions. "Whatever the San Francisco disaster may have done," he says, "I see no indications of any falling off in the general business of the country. I find that in three weeks we have booked orders, principally for car brakes for next year, which it will take four months to fill. We have enough business in locomotive brakes to keep us busy for the year, but the principal pressure is in brakes for cars. The car companies cannot turn out cars fast enough for the railroads and are far behind on orders. Reports from our Russian works are highly satisfactory. The Russian government is now in funds and important work for the state railways is in sight, while our general business in Russia and out of it continues to increase."

American Society of Mechanical Engineers.

(Special Staff Correspondence.)

Chattanooga, May 5.—The fifty-third meeting of the American Society of Mechanical Engineers was held in this city from May 1 to 4. The first session was held on Tuesday evening, and was a welcome to the city, and a social reunion, as was briefly related in THE IRON TRADE REVIEW last week. Members and guests began arriving at the headquarters in the Read House on Monday evening, and on the opening of the first session there were 126 registered. It had originally been planned to hold all professional sessions in the assembly hall of the Read House, but it proved too small and arrangements were made whereby the hall of the Masonic Temple was utilized.

Wednesday's Meetings.

The serious work of the convention began Wednesday morning, when promptly at 9:30 President Taylor called the meeting to order for the transaction of business and the reading and discussion of papers. Secretary Hutton first reported to the society regarding the election of new members, stating that all of those whose names had been passed by the council and submitted to the members had been elected. A proposed change in the by-laws, concerning a change in the method of expending appropriations was then laid before the meeting, after which the secretary read the report of the architects dealing with the condition of the new engineering building in New York, which Andrew Carnegie is building for the principal engineering societies. On April 26 the steel work was completed, the walls up to the third floor completed, the electrical risers, elevator guides, etc., were all in an advanced stage. In a few weeks, at most, the building will be entirely enclosed, and it will then be rapidly pushed to completion.

The secretary also read a communication from the board of governors of the Jamestown, Va., exposition, inviting the society to hold its May, 1907, meeting at the exposition. On motion this was referred to the council for action.

Two amendments to the constitution were offered by Chas. W. Hunt and Jesse M. Smith, respectively. The first provided for the appointment of an honorary secretary, substantially as explained editorially in THE IRON TRADE REVIEW of April 5, 1906. The second for the appointment of a standing research committee, to provide the mechanism whereby the society could undertake research work. This concluded the general business of this session, and the meeting passed to the reading and discussion of papers. Those on the program for this meeting were: "Report of Committee on Standing Proportions for Machine Screws," "Report of Committee Co-operating on Pennsylvania R. R. Locomotive Tests," "Effect of a Blow," by A. W. Moseley and J. L. Bacon.

The report on the proportions of machine screws was presented at the December, 1905, meeting in New York, and was the subject of considerable discussion. It was at that time referred back to the committee for further consideration, and was presented again at this meeting with changes made in accordance with the ideas then developed. The modified report deals with the form of thread, diameters, threads per inch, standard reference thread gauges, basis and working for screws and taps, limits of variation in external diameter, pitch of thread, etc., and proportions of the heads. L. D. Burlingame presented a written discussion of this report in which he criticized the form of thread recommended, as being too sharp. He also stated that the series of diameters was not in regular progression, and advocated the adoption of the American Screw Co.'s standard, and of fractional sizes. The screw thread micrometer had been criticized at various times, but Mr. Burlingame defended its use for measuring screws, stating that it was used with perfect satisfaction by Brown & Sharpe. G. A. Gulowsen also discussed the report, stating that the tap should not size the outside diameter of the screw. The report and discussion were referred back to the committee with instructions to report at the next meeting.

At the conclusion of the discussion of this report, the report of the committee co-operating on the Pennsylvania railroad locomotives tests was read by title by the secretary, who also read a written discussion prepared by E. G. Bailey. The report detailed the tests made on eight locomotives of various types at the St. Louis exposition by representatives of the Pennsylvania railroad, the Louisiana Purchase Exposition and the American Society of Mechanical Engineers. The tests determined the tractive power of the various locomotives, the indicated horsepower, the machine friction, the full consumption, etc. Mr. Bailey's discussion dealt with methods of fuel analysis and laid stress on the necessity of more accurate sampling of the fuel used in boiler tests. He presented tables showing the variable results obtained in the analyses of a given lot of fuel where the sampling was not done with the utmost care.

The paper entitled "Effect of a Blow" was then read by title by the secretary. The method of determining the work of a blow was as follows: Two plugs of steel were made and one was subjected to a blow from a steam hammer, allowed to fall by gravity, without steam. The kinetic energy of the hammer was calculated and the plug was then measured, both in area and length, and compared with the other plug which had been compressed in a testing machine. The amount of energy lost in compressing the plug by the hammer was calculated by comparing the work done in the testing machine and by the hammer. This paper was discussed by Prof. D. S. Jacobus, who criticised the method adopted by the authors in measuring the work done by the hammer. He doubted if the results obtained by this method were accurate. This concluded the regular program of papers for this session, but as they had occupied much less time than had been contemplated the following papers which had been appointed for a later session, were taken up:

Other Papers Presented.

"A History of the Introduction of a System of Shop Management," by James M. Dodge; "Collapsing Pressures of Bessemer Steel Lap-Welded Tubes," by R. T. Stewart; "Manganese Steel," by Henry D. Hibbard; "New Liquid Measuring Apparatus," by Geo. B. Wilcox; "Low Resistance Thermo-Electric Pyrometer and Compensator," by William H. Bristol. Mr. Dodge's paper, and Prof. Bristol's were read at society reunions in New York during the winter, and were deemed of such value that they were presented again at this meeting together with the discussions on them held at the reunions in order that they might be incorporated in the transactions. Prof. Bristol's paper will be published in a later issue of THE IRON TRADE REVIEW.

Mr. Dodge's paper dealt with the history of the Taylor system of shop managements in the works of the Link Belt Engineering Co., Philadelphia, of which he is president. It recounts, briefly, the reasons for the introduction of the system, and the success which had attended its installation. This will be gone into further in a later issue of THE IRON TRADE REVIEW.

Prof. R. T. Stewart's paper on the "Collapsing Pressure of Bessemer Steel Lap-Welded Tubes" was then read in abstract by the author. This paper is a record of a research undertaken for the

purpose of supplying an urgent demand for reliable information on the behavior of modern wrought tubes when subject to fluid collapsing pressure. The work was done at the McKeesport works of the National Tube Co., and in preparation and execution required a period of four years, and the services of one to six men. Two series of tests were made on various sizes of tubes. The object of the first series was to obtain data for determining which, if any, of the existing formulae were applicable to modern steel lap-welded tubes, especially when used in comparatively long lengths. The object of the second series was to obtain, for commercial tubes, the manner in which the collapsing pressure of a tube is related to both the diameter and thickness of wall.

Highly Commended.

The paper comprises nearly 100 pages, 6 by 9 inches, with numerous insert plates, and an outline, even, of it, is impossible in the limited space here available. The paper was the subject of much favorable comment, putting on record, as it did, much information which was entirely unknown before, and placing in possession of the engineering profession formulae and knowledge whose value can hardly be estimated. Both President Taylor and Calvin W. Rice, chairman of the committee on papers, commended Prof. Stewart's efforts in the preparation of the paper, stating that it was work of this character which gave the society the international reputation it now enjoys.

At the conclusion of Prof. Stewart's paper, Prof. Bristol gave a demonstration of the thermo-electric pyrometer. The instrument was the subject of great interest, and after the meeting the members crowded around Prof. Bristol for half an hour seeking further information. It was the consensus of opinion that the pyrometer fills a long-felt want, in providing an instrument which is comparatively low priced, and which will do the same work and stand rougher useage than the much higher-priced and extremely delicate pyrometers heretofore used.

The paper by George B. Wilcox was read by the secretary. This paper describes a liquid measuring apparatus, which is applicable to boiler-testing, and other work in which large quantities of liquid are to be handled. The notable features of the device are: elimination of constant errors of graduation, present in many water meters; its operation is not appreciably affected by temperature, head, or quantity of discharge of the liquid being weighed; and clogging by dirt is not liable to occur. This paper will be published in an early issue of THE IRON TRADE REVIEW. It was discussed by Prof. Jacobus, who inquired if the apparatus had been tested at various speeds, say at full, one-half, and one-quarter capacity. If it had been, and the maximum error of one-quarter of one per cent as stated by the author was correct, then this was a remarkable machine. W. T. Donnelly commented favorably on the apparatus, for its use would dispense with more or less inaccurate water meters, and cumbersome weighing barrels in boiler tests. At the conclusion of this discussion the session adjourned.

Wednesday Afternoon.

At two o'clock Wednesday afternoon the entire party of members, guests and ladies took cars at the Read House, which conveyed them to the foot of the inclined railway up Lookout Mountain. This railway, operated by cable, is extremely steep, the grade at the upper end being 62 per cent. Ten minutes are required to make the trip to the top; two cars are used, one acting as a counter-weight for the other.

Arriving at the top of the incline, the party spent a couple of hours visiting points of interest, wandering over the battlefield, and enjoying the magnificent panorama spread out below them. It was on Lookout Mountain, and in the country immediately surrounding Chattanooga, that the bloodiest and most desperately-contested battles of the civil war were fought. The battlefields are in plain view from the summit. The Hon. Henry Clay Evans, who is perfectly familiar with the historic events which transpired on these fields, addressed the engineers on the summit, reciting the story of the battles and pointing out the various points held by the opposing armies. To those privileged to be present it was a most inspiring event. In the evening, the citizens of Chattanooga tendered a reception to the engineers which was largely attended and thoroughly enjoyed. Dancing was engaged in to a late hour.

Thursday Morning Session.

The closing business session was held Thursday morning in the Masonic temple. The first paper read was entitled "The Improvement of the Tennessee River." The paper was prepared by Thos. E. Murray, and read by Geo. A. Orrok. The paper details the work being done by the federal government in improving the river for navigation, at Hale's Bar, 33 miles below Chattanooga, in conjunction with the erection of a power plant by private enterprise. A dam and lock are being built, which will insure a depth of not less than five feet of water in the river at all times.

Governmental Co-operation.

Considerable discussion was caused by Mr. Murray's paper. W. T. Donnelly called attention to the harmony and the co-operation of the general government with private enterprise. He said in part:

"Before the railroads the waterways had extreme development but with the advent of the railroads the change was so great—that to a large extent—the utilization of the waterways was superseded.

"It is not an economic truth that the railways can entirely supersede the waterways, and as we come to a more complete development of the country it becomes necessary for us to utilize all possible means of communication. This is a particular instance of where the efforts of the government to promote the use of the waterways of commerce have resulted in a much greater utilization of the power.

"In all probability the attention of the engineers and the commercial end of the proposition would not have been initiated had not the government made elaborate surveys and procured an elaborate amount of data which would show the possibilities in connection with this river.

"In so far as I know this is the first instance in which private enterprise and the government have worked together. Modern engineering tends to introduce many new factors, and the more factors properly introduced, the more possibilities there are in achievement."

H. M. Lane inquired if consideration had been given to the question of the denudation of forests in the watershed, as affecting the flow of the river in the future. In other places the stripping of the country of trees had had the effect of diminishing the flow of rivers, and in this case it would prove very serious to the power and improvement schemes.

J. C. Guild, of Chattanooga, one of the men behind the power development replied to Mr. Lane. He said that the question had been considered, but that no trouble was anticipated. The timber was diversified in character and the lumberman going into the forest for a certain kind of timber, would cut only a very small percentage of the trees. He would not be able to sweep the land, as is done in other localities where the timber is of one kind. President Taylor and Major Newcomer, the government engineer in charge of the work, gave other instances of co-operation between the government and private enterprise in work of this character, notably the Fox river in Wisconsin, and the Cumberland river.

Forest Preservation.

Calvin W. Rice inquired if the society had taken any action, looking to the preservation of the forests of the country, and moved the appointment of a committee of five to report on the advisability of the society, memorializing congress on the subject of forest preservation. The motion was unanimously

carried. The question of the dam acting as a retaining wall for all the silt carried down the river was raised and Major Newcomer stated that the floods at high water would probably wash all accumulations from behind the dam. A statement from C. W. Hunt, that Napoleon claimed Holland because it was formed of land carried down by the Rhine, and that he owned the Rhine, caused considerable merriment, which was increased when President Taylor said that according to that reasoning Chattanooga and Tennessee owned New Orleans.

G. A. Orrock then gave some interesting figures, tending to show that the Tennessee had a flow much larger than many well known rivers. Some of these figures are as follows, the figures being cubic feet per second:

	Max. Flow.	Min. Flow.	Aver. Flow.
Merrimac, at Lawrence, Mass.	18,900	1,800	6,700
Connecticut, at Hartford, Conn.	200,000		1,700
Mississippi, at St. Paul, Minn.			18,000
Ohio, at Pittsburg		1,700	
Nile at Assouan, in Egypt	42,000	14,000	10,700
Indus, in India		50,000	185,000
Tennessee, at Chattanooga	500,000	4,800*	415,000

*Lowest flow in 80 years.

The average low water flow of the Tennessee was stated by Major Newcomer to be not less than 6,000 cubic feet per second.

Other Papers.

The remaining papers were read by title only, and there was no discussion on any of them. M. A. Replogle's paper dealt with the history of the development of the latest form of the modern water wheel governor. It relates the experiences of 14 years' work, gives the characteristics of a good governor and concludes with a description of the latest form of governor, which is almost perfect in its action.

Geo. J. Henry, Jr. submitted a paper entitled, "Regulation of High Pressure Water Wheels for Power Transmission Plants." The difficulties of regulating high-pressure water plants are considerable. Throttling the supply of water in the pipe line, which often carries a large volume of water, at pressures varying from 200 to 1,000 pounds per square inch is apt to produce water ram, which strains the pipe and may cause it to rupture, thus wrecking the power-house. Other methods of governing are wasteful of water, and a combination or compromise is necessary. Mr. Henry's paper describes the methods used in some of the large electric plants on the Pacific coast, and deals with deflecting nozzles, needle valves, by-passes, etc.

John Sturgess presented a paper on "Speed Regulation of Water Power Plants," in which he gave certain aspects of the problem of regulation of water power plants which are usually passed over with slight consideration. These relate to fundamental elements of design in the wheel itself and to the characteristics of governor action as obtained in the best practice. The paper discusses these features and gives a set of conditions of design which must be fulfilled in order to obtain the best results. It concludes with the records of a number of tests of water wheel plants.

The paper entitled "Turbine Design as Modified for Close Regulation," by Geo. A. Buvinger considers the design of the gates used in connection with the governors for turbines, and the modifications made necessary by the demand for close regulation. It also considers the influence of draft tube and feeders on regulation, and discusses the troubles and remedies, due to variable conditions introduced by the different parts.

The last paper of the session was that by William O. Webber, on "Efficiency Tests of Turbine Water Wheels." This gives the records of a series of consecutive tests under uniform conditions, to determine the efficiency of the wheels, ascertain the effects of corrosion and wear, and also to determine whether more modern wheels would show greater relative efficiencies, and whether it would be more economical to operate all of the wheels at part gate, or some of the wheels at full gate part of the time. The tests cover a wide range of speeds, systematically and consecutively. They show that wheels should be run at the speed for which they are designed under any given head. They also show that modern wheels with coarser buckets, having a spoon-shaped discharge depending below the guide ring of the wheel, and with the outer periphery of the bucket at discharge of greater diameter than the bucket at entrance, would give much more power, higher speed, and greater efficiencies from the same water than would older wheels without these modern improvements. The wheels tested were two vertical 54-inch Ridson wheels about 30 years old, a 40-inch Ridson wheel about 12 years old, and a 39-inch Hercules wheel.

A Valuable Souvenir.

After the papers had been disposed of, Secretary Hutton announced that the souvenir book of Chattanooga distributed to the convention was a gift to the members by Thos. E. Murray. This book is worthy of special mention. It comprises over 200 6 x 9 pages, contains a sketch of Chattanooga, of the National Military Park, Lookout Mountain, a history of the Chattanooga campaign, a sketch of Hamilton county, industrial Chattanooga, and the state of Tennessee. It is illustrated with about 50 inserted full page halftones, and a number of insert plates and maps. It formed a valuable guide book, and a handsome souvenir.

The convention then passed resolutions of thanks to the Chattanooga Railways Co. for the free transportation around the city furnished the society; to the Nashville, Chattanooga & St. Louis R. R., for a special train furnished the society, and to the local committee for the splendid manner in which it entertained the society. In this connection, it should be stated that there were but two members of the society residing in Chattanooga, but that civil, mining and electrical engineers residing in the vicinity co-operated with these two members in entertaining the society in a most delightful manner. After passing these resolutions, the convention formally adjourned. Excursions were laid out for Thursday afternoon and Friday which kept everyone fully occupied.

Thursday Afternoon and Friday Excursions.

At 2 p. m. Thursday the entire party took special cars which conveyed it up Missionary Ridge. Carriages were taken at the end of the car line, which drove the party over Chickamauga battlefield, and then to the parade ground of the Twelfth U. S. cavalry, which gave an exhibition regimental drill. The carriages were then resumed and the party driven back to the city, by way of the historic Missionary Ridge road, reaching town about 7:30.

On Friday morning a large number of the engineers, through the courtesy of the Ingersoll-Rand Co., visited the double-track tunnel which the Southern railway is driving through Lookout Mountain. The tunnel is being driven from both ends and both headings were visited, after which the compressed air machinery used in the work was inspected. In the afternoon, the members and guests were taken down the river on the steamer Forrest, to the site of the dam being built at Hale's Bar, and which was described in Mr. Murray's paper. The dam is located 12 miles in a straight line from Chattanooga, but the windings of the river make the trip by water 33 miles. The scenery along this part of the Tennessee rivals that of the Hudson, and the trip was one of the most enjoyable features of the entire meeting. Arrived on the site of the dam, the party disembarked and inspected the work. Brief addresses were made by Major Newcomer, who explained matters pertaining to the civil engineering features, J. C. Guild, who spoke on the electrical and mechanical work, Newell Saunders, chairman of the local committee, President Taylor and Secretary Hutton. The boat then conveyed the party to Shellmound, a few miles further down the river, whence a special train on the N., C. & St.

L. R. R. brought them back to the city. This closed the program of the convention. The total registration of the meeting was 178, over 100 of whom were guests. All the members, and the more prominent guests in attendance are given in the following list.

Those in Attendance.

Fred W. Taylor, President, Philadelphia.
F. R. Hutton, secretary, Prof. of Mech. Engineering, Columbia University, New York.
Francis W. Hoadley, assistant to treasurer and secretary, A. S. M. E., New York.
Louis A. Gillet, assistant to secretary, A. S. M. E., New York.
C. A. Morrison, New York, N. Y.
Newell Sanders, Pres. Newell Sanders Plow Co., Chattanooga.
B. T. Burt, Chattanooga.
H. S. Chamberlain, Chattanooga.
W. H. Collier, Chattanooga.
J. C. Guild, Chattanooga.
Wm. H. Hume, Chattanooga.
Mai. H. C. Newcomer, U. S. army engineer in charge of Tennessee river improvement, Chattanooga.

Members and Guests.

H. M. Montgomery, Alberger Condenser Co., Chicago.
J. W. Paul, Supt. Pittsburg Writing Mach. Co., Kittaning, Pa.
Harris Tabor, Elizabeth, N. J.
Jesse M. Smith, consulting engineer, New York.
E. E. Wood, Jackson, Mich.
Albert Stearns, Supt. Church & Dwight, Syracuse, N. Y.
Jno. M. Sweeney, Steel Cable Engineering Co., Chicago.
Geo. A. Orrok, head draftsman, N. Y. Eaison Co., New York.
H. S. Riddle, Columbus, Ohio.
Geo. H. Waters, F. H. Verdon Co., West New Brighton, N. Y.
C. R. Gabriel, Cincinnati Milling Mach. Co., Cincinnati, O.
J. G. O'Neil, contracting engineer, Chicago.
A. W. Fischer, vice president, Schutte & Koerting, Philadelphia.
George I. Rockwood, consulting engineer, Worcester, Mass.
M. L. Cooke, Germantown, Pa.
Geo. H. Barrus, consulting engineer, Boston, Mass.
Elmer H. Neff, Brown & Sharpe Mfg. Co., New York.
John S. Hunter, Hartford, Conn.
Robt. T. Burwell, Hartford Steam Boiler Insp. Co., New Orleans.
C. W. Whiting, Cambridge, Mass.
W. P. Caine, Tennessee Coal, Iron & R. R. Co., Ensley, Ala.
Daniel W. Tower, Pres. Grand Rapids Brass Co., Grand Rapids, Mich.
Rodney C. Penney, Bangor, Me.
Robert Thurston Kent, IRON TRADE REVIEW, Cleveland.
H. B. Ayers, Supt. Pgh. Works, Am. Loco. Co., Allegheny, Pa.
C. W. Crawford, Brazil, Ind.
Thos. W. Capen, Allis-Chalmers Co., Milwaukee, Wis.
E. E. Hanna, Evanston, Ill.
James W. Nelson, Mgr. Richard Dudgeon, N. Y.
Ira H. Woolson, New York.
F. H. Stillman, Pres. Watson-Stillman Co., New York.
H. Harcourt Dixon, G. E. Dixon & Co., Chicago.
Chas. B. Barnes, Chicago.
I. Lawrence Hagy, Elec. Storage Battery Co., Philadelphia.
D. T. Randall, Asst. Prof. steam engineering, University of Ill., Urbana, Ill.
Jno. M. Snodgrass, Inst. in Mech. Eng., Univ. of Ill., Urbana, Ill.
Geo. B. Stetson, Pres. New Bedford Gas & Edison Light Co., New Bedford, Mass.
O. P. Hood, Prof. Mech. Engineering, Mich. College of Mines, Houghton, Mich.
Thos. Hill, Supt. Quincy Eng. Works, Quincy, Ill.
George M. Brill, consulting engineer, Chicago, Ill.
S. B. Earle, Clemson College, S. C.
W. W. Ricker, New York City.
J. F. Buckley, Beloit, Wis.
A. B. Clemens, Internat'l. Corresp. Schools, Scranton, Pa.
M. B. Clemens, Bridgeport, Ala.
William D. White, Worcester, Mass.
Luther D. Burlingame, Brown & Sharpe Mfg. Co., Providence, R. I.
Alex. T. Brown, Smith Premier Typewriter Co., Syracuse, N. Y.
Calvin W. Rice, Cons. Engineer, General Elec. Co., New York City.
W. T. Sears, Penn. Steel Co., Philadelphia, Pa.
Fred M. Reed, New Bedford, Mass.
W. T. Wheeler, New York.
Harry J. Marks, New York.
F. R. Low, editor *Power*, New York.
G. M. Basford, editor, *American Engineer*, New York.
H. L. Gantt, consulting engineer, Pawtucket, R. I.
Geo. Fred Higgins, Allan-Higgins Co., Worcester, Mass.
Fred J. Miller, *American Machinist*, New York.
S. O. Vickers, Atlanta, Ga.
T. B. McKleery, Chattanooga.
Wm. A. Bole, Westinghouse Mach. Co., Pittsburg.
D. S. Jacobus, Prof. Experimental Engineering, Hoboken, N. J.
Wm. T. Donnelly, consulting engineer, New York.
W. E. Snyder, Am. Steel & Wire Co., Pittsburg.
Chas. E. Ferris, Prof. Mech. Engineering Univ. of Tennessee, Knoxville, Tenn.
Jno. I. Wilmore, Prof. Mech. Engineering, Ala. Poly. Inst., Auburn, Ala.
W. L. Newton, Chattanooga.
Gus. C. Henning, New York.
F. E. Schmitt, *Engineering News*, New York.
John D. Bird, Fairbanks, Morse & Co., Beloit, Wis.
Chas. W. Hunt, Pres. C. W. Hunt Co., New York.
F. A. Halsey, *American Machinist*, New York.
H. R. Cobleigh, *Iron Age*, New York.
W. L. Catlin, Chattanooga Machinery Co., Chattanooga.
F. T. Adams, Allis-Chalmers Co., Milwaukee, Wis.
R. W. Emerson, Singer Mfg. Co., South Bend, Ind.
James Gardiner, Chicago.
W. Morava, contracting engineer, Chicago.
Wm. H. Bristol, Prof. Mathematics, Stevens Inst., Hoboken, N. J.
Mark A. Replogle, Replogle Governor Works, Akron, Ohio.
Arthur L. Rice, Editor *The Engineer*, Chicago.
W. W. Macon, *The Engineering Record*, New York.
Charles W. Melcher, Ingersoll-Rand Co., Chicago.
L. F. Thompson, Knoxville, Tenn.
E. L. Ohle, Prof. Mech. Engineering, Univ. of Iowa, Iowa City, Ia.
S. A. Worthington, Knoxville, Tenn.
R. T. Stewart, Western University of Pa., Allegheny, Pa.
Geo. A. Buvinger, Platt Iron Works, Dayton, Ohio.
C. G. Herbert, Solvay Process Co., Detroit, Mich.
L. K. Malvern, Elgin Nat'l. Watch Co., Elgin, Ill.
O. A. Stranahan, Allis-Chalmers Co., Milwaukee.
E. H. Foster, Vice Pres. Power Specialty Co., New York.
Frank B. Kleinhans, United Engineering & Foundry Co., Pittsburg.
Jos. G. Prosser, Chicago, Ill.
Harry Wise, *The Tradesman*, Chattanooga.
Max I. Barth, *The Tradesman*, Chattanooga.
Frederick D. Herbert, Editor *Marine Engineering*, New York.
Geo. Langen, Cincinnati.
H. M. Lucas, Lucas Machine Tool Co., Cleveland.
H. M. Lane, editor, *The Foundry*, Cleveland.
Harte Cooke, Mackintosh, Seymour & Co., Auburn, N. Y.
H. E. Trontman, Indianapolis.
T. T. Brav, Pittsburg.
M. H. Wickhorst, Aurora, Ill.
E. H. Mumford, Philadelphia.
S. T. Wellman, Wellman-Seaver-Morgan Co., Cleveland.

THE ALLIS-CHALMERS 100-TON FLAT CAR.

In the accompanying illustration is shown the new car especially designed and built for the Allis-Chalmers Co., to transport the heavy castings for the rolling mill engine built for the Carnegie Steel Co., at Sharon, Pa.

This car, which was fully described in our issue of Feb. 8, was designed at the West Milwaukee car shops of the C. M. & St. P. railway, and is the most unique one in existence in the matter of construction and size. The traffic department of the Allis-Chalmers Co. will run these new cars as a special train to the destination, and the size of the castings, which are perhaps the largest ever attempted for this class of work will make the whole undertaking an extremely noteworthy advance in the matter of handling heavy work.

BETHLEHEM ANNUAL REPORT.

The record of earnings of the Bethlehem Steel Corporation for the year ending Dec. 31, 1905, was published in THE IRON TRADE REVIEW of April 5. The general balance sheet of this corporation and its subsidiary companies as of Dec. 31, 1905, is as follows:

ASSETS.

Property account	$32,001,264
Raw material, supplies, etc.	2,794,133
Worked matter and contracts in progress	4,088,137
Accounts receivable (net)	2,300.147
Notes and bills receivable (net)	245,415
Adv. and accrued interest	125,116
Marketable securities	557,196
Due from receiver U. S. Shipbuilding Co.	150,856
Cash on hand, etc.	571,237
Cash on special dep'it for retirem't bds	874,386
Deferred charges to future operations	150,295
Total	$43,858,182

LIABILITIES.

Preferred stock	$14,908,000
Common stock	14,862,000
Bonded debt subsid cos	1,351,000
Bethlehem Steel purchase money bonds	7,408,000
Notes payable	1,059,000
Accounts payable	1,349,196
Payrolls accrued	375,555
Bond interest accrued	123,645
Prov for accruing and other liabilities	97,494
Depreciation fund	400,000
Reserve fund	80,671
Profit and loss surplus	1,843,619
Total	$43,858,182

During the year $3,600,000 collateral trust 6 per cent bonds were paid off, while the Bath Iron Works and the Hyde Windlass Co., of Bath, Me., were sold.

The annual report of President Chas. M. Schwab to the stockholders is in part as follows:

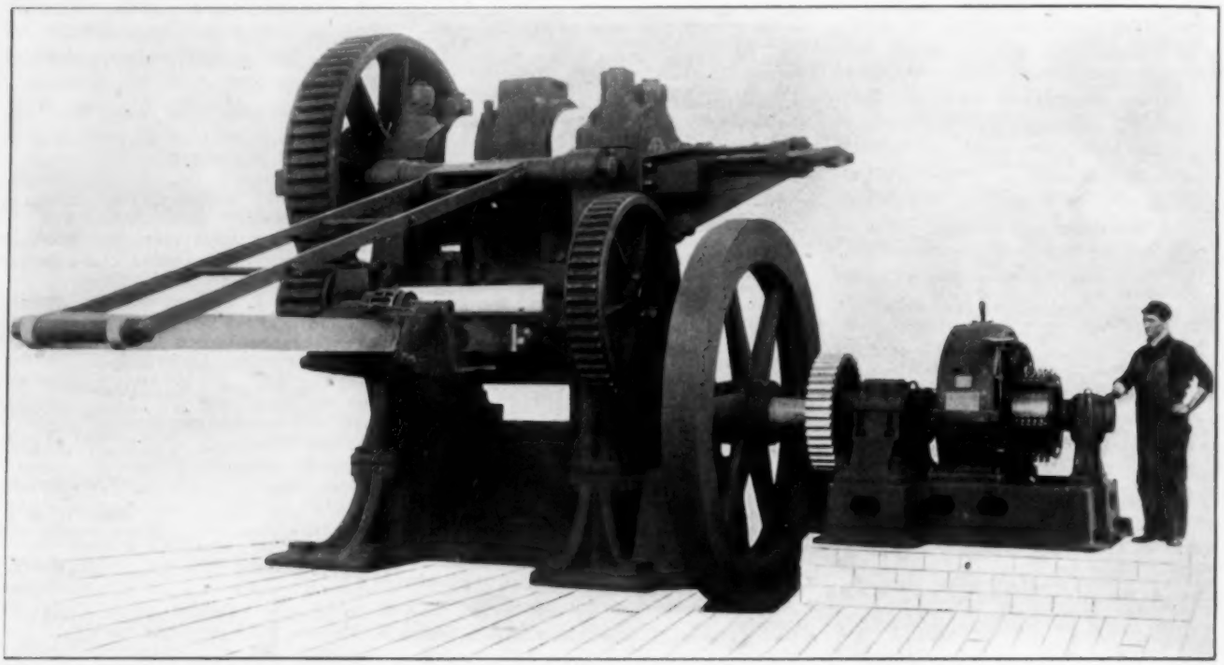
"A careful study of the situation at this plant convinced your officers and directors that a still further development was desirable, and it was determined to continue the increase of the old plant, particularly in blast furnace capacity, as well as to establish a new plant to be devoted to the manufacture of open-hearth steel, structural shapes, rails, billets.

"For this purpose about 250 acres of land adjoining the old plant was purchased and plans for the new furnaces, mills, to be erected thereon, definitely adopted. This work is now being pushed rapidly."

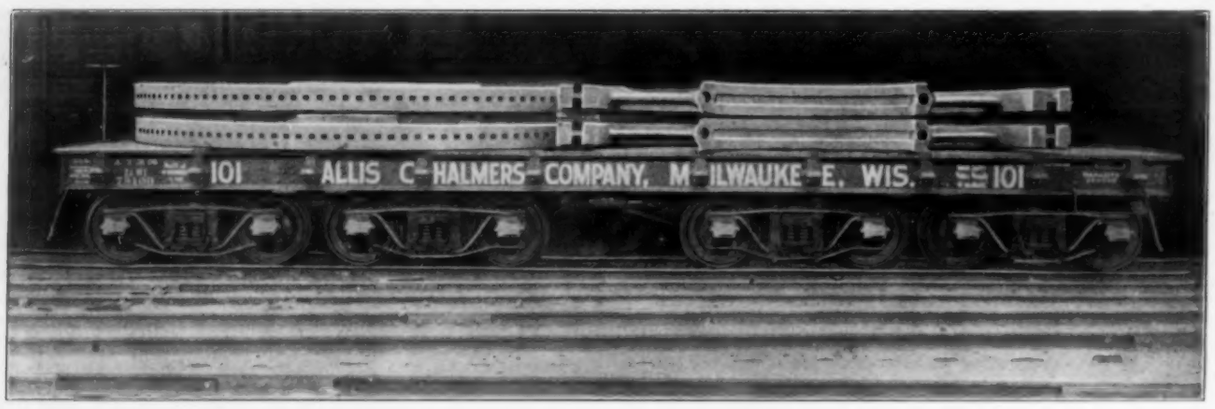
NEW BLOOM SHEAR.

Youngstown Sheet & Tube Co.

The accompanying cut shows the new bloom shear recently designed and built for the Youngstown Sheet & Tube Co., Youngstown, O., by the United Engineering & Foundry Co., Pittsburg, which, beside being a very powerful machine, has several novel features. The general construction of the shear is of the usual type, with straining rods keyed into the main bed plate and having nuts on top of the main caps. The main shaft is 22 inches diameter at the crank pin and is driven by a gear of 90-inch pitch diameter. The machine is driven by 150 horsepower motor and is geared to make 12 cuts per minute. The clutch operating mechanism is a particularly novel feature, being operated by hydraulic cylinders connected to the clutch by a rod running entirely through the main eccentric shaft. By this means an overhung clutch operating bracket is avoided, and the pull of the cylinders comes directly on the clutch. While this construction is somewhat expensive, it is thought that the advantages gained amply repay the increased cost. On the knife head is located a hold down, operated by hydraulic power and arranged so that as the knife descends, the hold down grips the piece and prevents the end turning up. The shear is also supplied with a gauge of very heavy construction, adjustable to a quarter of an inch, which slides on bars suspended from the rear of the shear. On the gauge buggy is a pinion engaging a rack between the bars. The adjustments are obtained by inserting a pin through the pinion and vernier on either side of the pinion. The knife head is counterbalanced by hydraulic cylinders placed outside the shear housings and connected to the head by a heavy bar which runs entirely through the head. This locates the cylinders so as to be well protected from scale and heat, and at the same time gives them a direct action on the head. The shear has capacity to cut 6 x 30-inch hot steel, with ample safety margins. Steel castings are used wherever severe shock or strain is encountered. The knives are supported on heavy cast steel liners, arranged to distribute the load and avoid breaking out the heads. The shear is of very heavy construction throughout and the builders consider it their best production in this line.



NEW BLOOM SHEAR BUILT BY THE UNITED ENGINEERING & FOUNDRY CO.



100-TON FLAT CAR OF THE ALLIS-CHALMERS CO

PHILADELPHIA FOUNDERS

Discuss the Labor Problem.—Unsatisfactory Results with Poor Molders.

The monthly meeting of the Philadelphia Foundrymen's Association, which was held at the Manufacturers' Club on the evening of May 2, was marked by an unusually interesting discussion of the very unsatisfactory labor conditions that prevail in so many of the foundries of the country. The matter was brought up by the reading by A. A. Miller of the following communication on the subject, with suggestions for a remedy, from William Cook, foreman of the Haines, Jones & Cadbury Co.'s foundry at Norristown, Pa.:

Mr. Cook's Letter:

"A great question has come up before the Foundry Foremen's Association, which has puzzled every manufacturer in the iron business, superintendent and foreman, and which has been the cause of the loss of many thousands of dollars. I know by my own experience the difficulties we have suffered in filling our contracts in the time limit, some even having been canceled.

"This was caused by our hoboes or floating labor. I have experienced great difficulty when the firm I was with made a contract to deliver material within a certain time set by the superintendent and myself, which involved thousands of dollars and which through hoboes and floating labor we were unable to fulfill. The firm would then complain because the foreman had not employed steady men, when, if the truth were known, he had to take whomever he could get because work was plentiful and all good men had steady jobs.

"I have an idea which I have been studying for some time and which I feel it is my duty to make public for the benefit of the manufacturers. My idea is to have the association provide ways and means to teach apprentices in a good thorough course of whatever class of work they prefer. I do not think it would take many years to do away with our hoboes and floating labor. I think a fund should be started by the manufacturers to establish a foundry and divide it into the several departments: stove department, steel department, machine department, plumbers' supply department and a brass department. This should be called a foundry institution. The management of this should be under one superintendent. The manufacturers should vest in him the power to obtain a first-class mechanic or foreman for each department and to see that they received into their departments only apprentices who would learn the trade properly and be a benefit to it. The time for the youths to serve I would leave to the association to decide, but I think it should be not less than four years. Each apprentice should be fairly well educated. There should be nothing but marketable goods manufactured, and the disposing of the goods should be left to the association or to a committee formed for that purpose.

I think it would only be a matter of a few years, say, two or three, before this would pay for itself. This would be one of the greatest benefits to the manufacturer, for in a few years he would have skilled, intelligent mechanics. In the course of ten years you would find very few hobo molders, for when each apprentice has served faithfully and honorably, he should be given a diploma and should be given preference when he applies for work at other foundries.

"Now, gentlemen, I have only given you my idea, which is open to amendment and improvement, for many heads are better than one. I have merely given you the key to my own idea, and I hope you will take the matter up and give it serious consideration, for the time will come sooner or later when something will have to be done, because skilled labor has become necessary both to the business and welfare of the country."

Various Opinions Expressed.

In the discussion which followed the reading of the paper, Mr. Cook's suggestion of a school for apprentices was not seriously considered, but general complaint was made of the character of much of the labor employed in foundries, and the matter was generally conceded to be a very serious one. W. O. Steele said that the question was one which was under constant discussion by the Foundry Foremen's Association, and W. A. Perrine, after giving at some length his own experiences, said he could suggest no remedy except the better education of molders. D. G. Moore said his company at Elizabethport, N. J., had tried the plans of bonuses for men who would work steadily every day, having set aside as much as $3,000 a year for this purpose, but without much success. One reason for existing troubles he thought was that the men made too much money. When they made enough in three or four days to live on, they were unwilling to work the rest of the time.

H. O. Evans contended that the manufacturers were much to blame, as the men were generally compelled to work in dirty, ill-lighted shops, where no attention was paid to their comfort or to lightening their burden in the handling of the sand. Brighter shops and more welfare work he thought would do much to cure present evils. This view was controverted by another speaker, who referred to a bright cheerful shop where the men still kicked and frequently stayed away from work.

W. J. Shannon, of the Bethlehem Steel Co., spoke of the difficulty of securing good men in the country because of the lack of amusements, and believed that the best way to hold them was by interesting them in the purchase of a home. P. D. Warner, of Reading, also spoke.

It was agreed by all the speakers that it was difficult to get good apprentices, and that the class of boys taking up the trade of molding was much inferior to those of 25 or 30 years ago. So much interest was aroused by the discussion that it was generally agreed that it would be well to devote a future meeting to a more careful consideration of the whole matter.

The association voted $100 for the relief of the San Francisco sufferers, and Secretary Evans announced that, through the association as a medium, some three or four members had contributed some $500 to the same cause, while many other members had assisted through various relief funds. After some discussion of inviting the American Foundrymen's Association to hold its 1907 convention in Philadelphia it was decided that separate invitations should be extended by the local organizations of foundrymen and foundry foremen to the two national bodies, but that committees of the two Philadelphia associations should co-operate in entertaining the delegates. R. H. Day, of Day Bros., was elected a new member.

The technical paper of the evening was read by Harry D. Harvey, of the Monarch Engineering & Mfg. Co., of Baltimore, on "The Steele-Harvey Crucible Melting Furnaces for Brass Foundry Practice, Using Oil or Gas for Fuel."

Dean Brothers Steam Pump Works, Indianapolis, Ind., is distributing circular No. 54, describing the Atlantic type of boiler feed for pressure pumps. Five different types are described and illustrated.

The Wellman-Seaver-Morgan Co., Cleveland, O., has brought out a catalog of electric hoists. Various types adapted for different uses are described and illustrated.

Active Week Ends in Sharp Advance.

The liquidating movement following the San Francisco disaster came to an end during the past week, and the stock market strengthened noticeably late in the week, closing prices as the result being slightly above those of April 28. The force of the San Francisco horror had largely expended itself before the week opened, but other factors continued a depressing influence. The announcement that President Roosevelt would send a message to congress concerning alleged discrimination in rates affecting the Standard Oil Co. hung as a cloud over railway and allied securities. When the message finally appeared it developed that it was more favorable to the railroads than had been expected, and even Standard Oil gained a few points. The market on Monday, following the severe break of the preceding week, rallied over two points, then broke sharply again, and reached a new low point, but on Friday enjoyed another pronounced rally. This last was due to several causes. It was practically settled that a strike in the anthracite region would be avoided. The labor troubles on the lakes, directly affecting furnace operations, showed an increasing tendency toward adjustment, and the labor situation otherwise was materially improved. Gold engagements continued on a large scale, and the demands of San Francisco and the Pacific coast were well supplied. In view of these developments the belief was general that the end of the remarkable liquidating period had come. Since the early part of 1905, prices for both railroad and industrial securities had been on a continuous rise until in numerous instances returns were at a ridiculously small rate. The market for weeks has been largely a speculative one, with steady advances, due chiefly to manipulation. A decline was inevitable and the catastrophe at San Francisco furnished the occasion. While the net losses were in many cases extremely heavy, and a large shrinkage in values and credit resulted, the movement was generally without disturbance. Operations during the week were extensive. On Wednesday sales of stocks ran to 1,500,000 shares, and the week's total was 8,762,900 shares. United Steel stocks and Colorado Fuel & Iron Co. were dealt in heavily; Tennessee Coal & Iron and International Steam Pump recorded good advances, the latter on the prospect of acquiring the Power & Mining Machinery Co.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. April 28	Closing Quotation May 5	Changes	Date of 1906 Ann. Meet.	Par Value	Capital Outstanding	Dividend Basis	Dividend Being Paid	Dividend Date Last Div Dec.
Allis-Chalmers Co	20⅛	21	+ ⅛	Sept.	100	19,820,000			
Allis-Chalmers preferred	55¾	55⅞	+ ⅛		100	16,150,000	7 cum		Feb., 1904
American Can	7⅝	7⅛	− ⅛	Apr. 24	100	41,233,300			
American Can preferred	60	61	+1		100	41,233,300	7 cum	5 Q.	Apr., 1906
American Car and Foundry	38¼	38⅛	+ ⅛	June 28	100	30,000,000			May, 1905
AmericanCar and Foundry preferred	101	100¾	− ¼		100	30,000,000	7 n. c.	7 Q.	Jan., 1906
American Locomotive	59¾	60⅛	+ ¾	Oct. 16	100	25,000,000			
American Locomotive preferred	111½	112⅝	+1		100	24,100,000	7 cum	7 Q.	Apr. 1906
American Shipbuilding	55½	55	− ½	Oct. 2	100	7,600,000	4	4 Q.	Apr., 1906
American Shipbuilding preferred	106	106			100	7,900,000	7 n. c.	7 Q.	Jan., 1906
American Steel Foundries	10¼	10⅝	+ ⅜	Oct. 3	100	17,700,000			
American Steel Foundries preferred	43	45⅛	+2⅛		100	17,700,000	6 cum		Aug., 1905
Barney & Smith	65	65		June 5	100	1,000,000			June, 1894
Barney & Smith preferred	140	140			100	2,500,000	8 cum	8 Q.	Mch. 1906
Bethlehem Steel	25⅝	26⅛	+ ⅜	April 3	100	15,000,000			
Bethlehem Steel preferred	85	85			100	15,000,000	7 n. c.	7 Q.	May, 1906
Bullock Electric preferred	111	111		Oct. 2	100	1,000,000	6	6 Q.	Jan., 1906
Cambria Steel	33¾	34¾	+1	March 20	50	45,000,000	6	7 Q.	Mar., 1906
Cambria Iron	49⅞	49⅞			50	8,468,000	4	4 S. A.	Apr., 1906
Colorado Fuel & Iron	46	45⅞	− ⅛	Oct. 15	100	30,132,000	7		Apr., 1902
Wm. Cramp & Sons Ship & Eng. Bldg. Co.	20	25	+5	May 31	100	6,018,000	5		Nov., 1902
Crucible Steel	13	13⅝	+ ⅝	Oct. 17	100	25,000 000			
Crucible Steel preferred	78	79¼	+1¼		100	25,000,000	7 cum		Sept. 1903
Empire Steel	7	7		Feb. 28	100	2,281,400			
Empire Steel preferred	35	35			100	2,500,000	6 cum	3 S. A.	Jan., 1905
Fay & Egan	93½	93½		Feb. 20	100	1,000,000	5	5 Q.	Nov., 1905
Fay & Egan preferred	128½	128½			100	1,000,000	7 cum	7 Q.	Nov., 1905
General Electric	102⅝	106½	+3⅞	May 8	100	48,256,050	8	8 Q.	Jan., 1906
International Pump	46	54	+8	June 5	100	12,362,500	2		July, 1905
International Pump preferred	83	85⅝	+2¾		100	8,850,000	6 cum	6 Q.	May, 1906
Lackawanna Steel	71	71		March 14	100	34,971,400			
Lake Superior Corporation	19	18½	− ½	Oct. 3	100	40,000,000			
Niles-Bement-Pond	130	130		Feb. 7	100	5,000,000	6	6 Q.	May, 1906
Niles-Bement-Pond preferred	105	105			100	2,000,000	6 cum	6 Q.	Mch., 1906
Otis Elevator Co	55	52	−3	March 19	100	6,350,300		2 A.	Apr., 1906
Otis Elevator Co. preferred	100	100			100	5,589,500	6 n. c.	6 Q.	Apr., 1905
Pittsburg Coal Co	14	13⅝	− ⅜	Feb. 12	100	30,135,000			
Pittsburg Coal preferred	55⅜	54	−1⅜		100	30,716,200	7		Apr., 1905
Pressed Steel Car	47½	47½		Feb. 21	100	12,500,000		3	Aug., 1904
Pressed Steel Car preferred	97	97			100	12,500,000	7 n. c.	7 Q.	May, 1906
Pullman Palace Car	220¼	221	+ ¾	Oct. 18	100	74,000,000		8 Q.	Feb., 1906
Railway Steel Spring	49¾	50	+ ¼	March 1	100	13,500,000		4 S. A.	Oct., 1905
Railway Steel Spring preferred	100¾	99½	− ¾		100	13,500 000	7 cum	7 Q.	Apr., 1905
Republic Iron & Steel	25¼	26¾	+1½	Oct. 17	100	27,352,000			
Republic Iron & Steel preferred	94⅛	95⅞	+1¾		100	20 852,000	7 cum	7 Q.	Apr., 1906
Sloss-Sheffield	73⅛	74¼	+1⅛	March 14	100	7,500,000	5	5	Jan., 1906
Sloss-Sheffield preferred	110	111	+1		100	6,700,000	7 n. c.	7 Q.	Jan., 1906
Tennessee Coal & Iron	139	144½	+5½	May 15	100	22,552,800		4 Q.	Apr., 1906
U. S. Cast Iron Pipe & Foundry	45⅝	46¾	+1⅛	June 27	100	12,500,000		2	June, 1906
U. S. Cast Iron Pipe & Foundry preferred	92¾	92	− ¾		100	12,500,000	7 n. c.	7	June, 1906
U. S. Steel	39¼	39⅞	+ ¼	April 16	100	508,302,500			Dec., 1903
U. S. Steel preferred	105	106	+1		100	360,281,100	7 cum	7 Q.	Feb., 1905
U. S. Steel 5's	99⅛	99	− ⅛		100	463,798,000	5	5 A.	
Virginia Iron, Coal & Coke	40	43¾	+3¾	Sept. 18	100	8,641,600			
Westinghouse Electric	150	156	+6	June 27	50	20,998,350	10	10 Q.	Apr., 1906
Westinghouse Air Brake	150	150		Oct. 2	50	10,990,450	20	20 Q.	Apr., 1906

Net earnings of the United States Steel Corporation for April are estimated at $13,000,000, or at the rate of $156,000,000 a year. This estimate is below the earnings of March, but is the heaviest April in the history of the corporation.

Failures during April, according to the mercantile agencies, were among the smallest for several months. Canadian failures were also much less than in April of 1905.

NEWS FROM MANY INDUSTRIES.

New Buyers:—

The Cambridge Steel Rolling Mill Co., Cambridge, O., has been incorporated with a capitalization of $150,000 by T. W. Scott, H. P. Woodworth, Charles S. Turnbaugh, L. T. Yoder and Charles Rief, Jr.

The Medina Iron & Brass Mfg. Co., Medina, N. Y., has been incorporated by Edward L. Sturgis, manager of the Central foundry at Medina, Fred T. Gates, Isaac S. Signor, and Jesse Landauer. For the present the company will locate in the old Bromley foundry at Albion, N. Y., and will manufacture soil pipe and brass and iron fittings.

The Enos Machine Co., Gallipolis, O., has been incorporated for $5,000 by B. T. Enos, C. D. Kerr, L. B. Shaw, Charles T. Stockhoff, Harry Moddy, and Jacob H. Frank.

The East Liverpool Foundry, Machine & Supply Co., East Liverpool, O., has been incorporated by J. C. Anderson and associates with a capitalization of $20,000.

The Meyer Foundry & Machine Co., South Bend, Ind., has been incorporated for $30,000 by Henry J. Meyer, Edward DeKezel and R. B. McInerny. It has acquired the plant of the Anderson Plow Works, a large well equipment structure, and will manufacture plows and hardware specialties and operate a foundry and machine shop.

The Canners' Engineering Co. will manufacture machinery and supplies for canners. The chartered capital stock is $50,000 and the incorporators are: William B. Phinney, Westfield, N. Y.; Herbert W. Allen, Buffalo, N. Y.; and Ralph J. Quale, Silver Creek, N. Y.

The Republic Machine Works, Kansas City, Mo., has been incorporated by W. J. Morgan, Webster Archer and Henry Davis. It will succeed the Morgan Machine & Engineering Co., 1422 Walnut street, Kansas City.

The Astona Foundry Co., has been chartered to carry on iron and steel work. The capital stock is $115,000, and the incorporators are: Walter H. Storm, Maywood, N. J.; George S. Andrews, No. 155 Norwood avenue, Brooklyn; and Chester J. Storm, Maywood, N. J.

The American Valve Co. has been incorporated with a capital stock of $150,000 to manufacture valves, etc. The incorporators are: George Green, Owen L. Whiteman, and E. R. Hotaling, all of Coxsackie, N. Y.

New Construction:—

The Charlotte Pipe & Foundry Co., Charlotte, N. C., which recently sustained a considerable loss by fire, is re-established in a temporary building and is now operating its soil pipe plant on regular time. Only about 10 days were lost on account of the fire. It is the intention of the company, within the near future, to replace the temporary building with a steel frame structure with galvanized roofing and siding. W. F. Dowd is president and treasurer.

The General Electric Co., Schenectady, N. Y., is to begin work at once on a large extension to the turbine department. The American Bridge Co. is to furnish the steel work and the structure is to be completed in 10 months.

The Bigelow Co., New Haven, Conn., manufacturer of boilers, has let the contract for an additional building 54 x 230 feet, of brick and steel construction.

The Crucible Steel Co., has let the contracts to the McClintic-Marshall Construction Co., for the building of its new plant at Lawrenceville near Pittsburg. The mill will occupy a site recently secured from the American Bridge Co. The plant will be equipped with 75 puddling furnaces.

The Paxton & Vierling Iron Works, Omaha, Neb., is considering plans for a new plant to be practically a duplicate of its present works. The main building will be entirely of iron, 60 x 200 feet. The addition will probably not be made until next spring.

The W. P. Davis Machine Co., Rochester, N. Y., has completed plans for a new shop building 40 x 160 feet, four stories in height and for a boiler house adjoining.

The Atlantic Insulated Wire & Cable Co., Stamford, Conn., has purchased a tract of land in that city and it is stated will erect a factory at once.

The Gorham Mfg. Co., Providence, R. I., is planning additions to its sand foundry which will double its capacity. The building with the addition will be 90 x 204 feet, of steel and reinforced concrete construction. A traveling crane and other equipment will be installed.

The Milwaukee-Western Fuel Co., Milwaukee, Wis., has let contracts for the construction of new coal storage docks at Milwaukee, which will cost about $500,000.

The Middletown Car Works, Middletown, Pa., is adding a steel structure 75 x 250 feet to its plant.

The Klotz Machine Co., Sandusky, O., has completed the work of remodeling and extending its plant, and has installed a variety of new equipment.

Viel, Cooper & Blackwell, 49 Wall street, New York, which was recently organized, will construct a canal from a point near LaSalle in the Niagara river to the gorge for the development of electricity and for the passage of lake vessels. The project involves an enormous expense, and will require considerable time for completion.

General Industrial Notes:—

The new Chattanooga furnace of the Chattanooga Iron & Coal Co. was blown in April 24. The torch was applied by the little daughter of John Dowling, superintendent of the plant. Work on the furnace was begun in March, 1905. It is complete in every way and will have a capacity of between 185 and 200 tons per day.

The Solid Steel Tool & Forge Co., Brackenridge, Allegheny county, Pa., lifted its receivership May 1. It is the successor to the James H. Baker Mfg. Co. James D. Wilson was the receiver.

A concern at Battle Creek, Mich., with net assets of about $38,000, operating a modern plant, is in search of some desirable article of machinery to manufacture. It will consider only an article of merit which has passed the experimental stage and also wishes to secure a small addition to its working capital and an experienced mechanic to take charge of that end of the business. The Johnson Foundry & Machine Works, Ltd., of Battle Creek, may be addressed.

The Slawson-Graham Co., 246 Greenwich street, New York, which was recently incorporated, will carry on a general contracting and machine business, and in addition will manufacture and sell the Bowne elevator signal system and the G-G damper regulator, the patents of which it owns.

The Shirley Radiator & Foundry Co. of Indianapolis and Shirley, Ind., on application of its president, Robert Martindale, has been placed in a receiver's hands, with assets in excess of $200,000 and liabilities of about $104,000. Insufficient working capital forced this move. The Union Trust Co., of Indianapolis, has been appointed receiver.

The De Pere Boiler & Iron Works, De Pere, Wis., has reoragnized by electing J. P. Dousman, J. S. Gittins and J. S. Chase to fill the unexpired terms

of A. B. Burns, D. M. Burns and J. A. Peters, resigned. A president is to be elected.

Adler & Co., Birmingham, Ala., have purchased the interest of E. M. Tutwiler in the Tutwiler Coal, Coke & Iron Co., for $1,680,000. The company owns and operates a blast furnace near Birmingham, and expects to add another stack. Its coal properties are extensive.

The Lake Shore Engine Works, of Marquette, Mich., has increased its capital stock from $102,980 to $150,000, to care for increased business.

C. A. Ford, of Kokomo, has been appointed receiver for the Atlanta Rolling Mill & Tin Plate Co., Noblesville, Ind. The plant represents an investment of $350,000, but has not been completed.

John Robinsteen, president of the Eleanor Iron & Steel Co., of Irwin, Pa., and George P. McCarty, agent of the company, are facing the charge of obtaining money under false pretense in connection with soliciting a bonus contingent upon starting the mills and keeping them running continuously.

The Hance Casting Co., Columbus, O., was recently organized by electing T. W. Hance, president, T. P. Eagelson, secretary and Harry T. Hance, treasurer and general manager, with A. B. Walker and E. C. Sherman as additional directors.

March exports of iron and steel aggregated $14,792,214 against $12,150,771 in March, 1905. For the nine months ending March 31, 1906, exports were $116,282,796 against $97,711,595 for the same period in 1905. Imports for March were $3,028,592 against $929,892 in 1905.

In endeavoring to provide a solution of the perplexing tie problem of the future, the Pennsylvania railway in 1902 planted 14,000 yellow locust trees, in 1905 about 200,000 and this year some 800,000 will be planted. So far the results have been indifferent.

The Wabash-Pittsburg Terminal Railway Co. states that its tracks are soon to be connected with those of the Union railway, of Pittsburg, giving it access to the works of the Carnegie Steel Co. A part of the additional $2,000,000 of its first mortgage 4 per cent bonds, recently listed on the stock exchange, is to be used in making this connection.

The Mexican imports during the fiscal year 1904-5 were $86,122,294 in gold and exports $93,468,660. The establishment of a gold basis in May, 1905 served to facilitate trade to a considerable extent. Sixty per cent of exports were mineral products and only four per cent manufactured products.

J. H. Gill, Raleigh, N. C., manufacturer of agricultural implements and architectural castings, is moving from his present stand which he has occupied for twenty-two years, to the plant recently occupied by the Lobdell Car Wheel Co. The foundry building is 80 x 230 feet, equipped with five steel cranes. A machine shop for the repair of machinery and locomotives is being added.

The McGuire-Cummings Mfg. Co., Chicago, has increased its capital stock to $1,000,000 and has absorbed the John J. Cummings Car Co., which recently established extensive works at Paris, Ill. Cars of all descriptions are manufactured, and its line of electric railway specialties enjoys wide favor. John J. Cummings is president, W. J. Cooks and C. H. Wilcox are vice presidents, and W. J. Cummings is secretary and treasurer.

Trade Notes:—

The Lackawanna Steel Co., in accordance with its recent decision to operate its mills principally by electricity, is installing the electrical machinery in its power house at West Seneca, N. Y. It is being furnished by the Westinghouse Electric & Mfg. Co.

The Riter-Conley Mfg. Co., Pittsburg, has secured the contract for constructing a steel roadway and bridge in Kansas City, Mo., and across the Kansas river to Kansas City, Kan. The viaduct will be 10,000 feet long, accommodating two street car lines, foot passengers and teams, will require about 15,000 tons of steel and will cost over $2,500,000.

The Railway Steel Spring Co., Latrobe, Pa., is soon to install a 20-inch and 34 x 42-inch Reynolds heavy duty cross compound Corliss engine, direct connected to a 500-kilowatt generator engine type, all of which will be furnished by the Allis-Chalmers Co. In addition, the Allis-Chalmers Co. recently sold a 14 x 36-inch Reynolds girder Corliss engine to the Union Iron Works Co., Springfield, Mo.; a 24-inch and 48 x 42-inch Reynolds vertical cross compound Corliss engine to the Michigan Copper & Brass Co., Detroit; a 14 x 24-inch Reynolds reliance Corliss engine to the Maryland Brick & Supply Co., Frederick, Md.; a 20-inch and 40 x 42-inch heavy cross compound Allis-Chalmers engine, direct connected to a 500-K. W. generator, to the American Can Co.; a 100-K. W. type "I" generator to the Chandler & Taylor Co., Indianapolis, and a 400-K. W. "A1" generator to the H. C. Frick Coke Co., Yorkrun, Pa.

J. Howard Jones & Son have removed their offices to 752 Monadnock block, Chicago, making a specialty of coke.

Matthew Addy & Co.'s New York branch is now located at Nos. 39-41 Cortlandt street. They were obliged to vacate their offices at No. 15 of the same street because the building is to be torn down to make room for a skyscraper.

The Western Maryland railroad has placed a contract with the Pressed Steel Car Co., of Pittsburg, for 700 steel coal cars to be delivered late this year.

The De La Vergne Machine Co., New York, is installing a refrigerating machine and a 25 horsepower Hornsby-Akroyd oil engine for Burk Bros. & Co., Kirksville, Mo., and another refrigerating machine with one seven horsepower and one thirteen horsepower engine for John B. Eyres, Paterson, N. J.

The Lunkenheimer Co., Cincinnati, the largest manufacturer of high grade engineering specialties in the world, has opened a well equipped branch store at 66-68 Fulton street, New York. The company up to this time maintained offices in the Havemeyer building, 26 Cortlandt street, for the transaction of export trade. The trade in New York and the east has been cared for by various supply houses, but the increased demand for specialties of the company necessitated the opening of a branch store from which the supply houses and the trade in that territory could be promptly accommodated.

The New York offices of the Baldwin Steel Co. have been moved from 107 John street to No. 133 Reade street.

James Stewart & Co., of Pittsburg, secured a contract to construct a railroad from Burketown, North Queensland, to Lillydale, Australia, opening up one of the most valuable mineral regions in the antipodes.

The Pennsylvania Steel Co., and its associated interest, the Maryland Steel Co., has established new offices in Chicago in suite 305 Western Union Building, Robert E. Belknap, being the resident sales agent.

Fires:—

The Raymond Mfg. Co., Middletown, Pa., will rebuild the machine and erecting shop recently destroyed by fire. The loss, which was about $30,000, was practically covered by insurance.

The blacksmith shop of the Illinois Steel Co., Chicago, was damaged to the extent of $40,000 May 3. The private fire department of the company held the flames in check until the arrival of the city department.

The Aetna Foundry & Machine Co., Springfield, Ill., sustained a $15,000 loss April 26, when fire destroyed its steel crane, brass foundry and casting room. Work of rebuilding has already been begun.